

SPARC Enterprise

M4000 / M5000 / M8000 / M9000 Servers



We make sure



SPARC® Enterprise M4000/M5000/M8000/M9000 Servers Dynamic Reconfiguration (DR) User's Guide

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Preface

This manual describes the Dynamic Reconfiguration (DR hereafter) function provided by SPARC Enterprise servers.

This manual is intended for users, specifically system management administrators who conduct operations on systems and domains.

In addition, before reading this manual, it is necessary to have read the *Servers Overview* and *Installation Guide* of each model, and the *SPARC Enterprise M4000/M5000/M8000/M9000 Servers Administration Guide* and *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

This section includes:

- [“Audience” on page xiv](#)
- [“Structure and Contents of This Manual” on page xiv](#)
- [“SPARC Enterprise Mx000 Servers Documentation” on page xv](#)
- [“Abbreviated References to Other Documents” on page xvii](#)
- [“Models” on page xviii](#)
- [“Text Conventions” on page xviii](#)
- [“Prompt Notations” on page xix](#)
- [“Syntax of the Command Line Interface \(CLI\)” on page xix](#)
- [“Software License” on page xx](#)
- [“Fujitsu Siemens Computers Welcomes Your Comments” on page xx](#)

Audience

This manual is intended for users, who administrate SPARC Enterprise M4000/M5000/M8000/M9000 servers (hereinafter referenced to as XSCF user). The XSCF user is required to have the following knowledge:

- Solaris™ Operating System and Unix command
 - SPARC Enterprise M4000/M5000/M8000/M9000 servers and basic knowledge of XSCF
-

Structure and Contents of This Manual

This manual is organized as described below:

- [Chapter 1](#) Overview of Dynamic Reconfiguration
This chapter provides an overview of DR.
- [Chapter 2](#) What You Must Know Before Using DR
This chapter explains conditions, configuration and checklists related to DR.
- [Chapter 3](#) DR User Interface
This chapter describes user interfaces of DR.
- [Chapter 4](#) Practical Examples of DR
This chapter describes sample operations of DR commands provided by DR.
- [Appendix A](#) Message Meaning and Handling
This appendix contains explanations and messages that might be displayed when DR is used.
- [Appendix B](#) Example: Confirm Swap Space Size
This appendix explains how to confirm whether the system has enough swap space for operating the DR function.

Glossary and Index

- [Glossary](#)
The glossary explains the terms used in this manual
- [Index](#)
The index provides keywords and corresponding reference page numbers so that the reader can easily search for items in this manual as necessary.

SPARC Enterprise Mx000 Servers Documentation

The manuals listed below are provided for reference..

Book Titles	Order No.
SPARC Enterprise M4000/M5000 Servers Site Planning Guide	U41674-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Site Planning Guide	U41685-J-Z816-x-76
SPARC Enterprise Equipment Rack Mounting Guide	U41711-J-Z816-x-76
SPARC Enterprise M4000/M5000 Servers Getting Started Guide	U41719-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Getting Started Guide	U41717-J-Z816-x-76
SPARC Enterprise M4000/M5000 Servers Overview Guide	U41675-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Overview Guide	U41686-J-Z816-x-76
Important Safety Information for Hardware Systems	U41715-J-Z816-x-76
SPARC Enterprise M4000/M5000 Servers Safety and Compliance Guide	U41676-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Safety and Compliance Guide	U41687-J-Z816-x-76
External I/O Expansion Unit Safety and Compliance Guide	U41716-J-Z816-x-76
SPARC Enterprise M4000 Server Unpacking Guide	U41720-J-Z816-x-76
SPARC Enterprise M5000 Server Unpacking Guide	U41728-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Unpacking Guide	U41718-J-Z816-x-76
SPARC Enterprise M4000/M5000 Servers Installation Guide	U41677-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Installation Guide	U41688-J-Z816-x-76
SPARC Enterprise M4000/M5000 Servers Service Manual	U41678-J-Z816-x-76

Book Titles	Order No.
SPARC Enterprise M8000/M9000 Servers Service Manual	U41689-J-Z816-x-76
External I/O Expansion Unit Installation and Service Manual	U41679-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Administration Guide	U41680-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide	U41681-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF Reference Manual	U41682-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Dynamic Reconfiguration (DR) User's Guide	U41684-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Capacity on Demand (COD) User's Guide	U41693-J-Z816-x-76
SPARC Enterprise M4000/M5000 Servers Product Notes	U4173x-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Product Notes	U4173x-J-Z816-x-76
External I/O Expansion Unit Product Notes	U41740-J-Z816-x-76

Note – " x " in the order number is the version number of the manual.

1. Manuals on the Web

The latest versions of all the SPARC Enterprise Series manuals are available at the following websites.

<http://manuals.fujitsu-siemens.com/>

2. Provided in system

Man page of the XSCF

Note – The man page can be referenced on the XSCF Shell, and it provides the same content as the *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*.

3. Documentation and Supporting on the Web

The latest information about other documents and the supporting of the SPARC Enterprise series are provided on the Web site.

a. Message

<http://www.fujitsu.com/sparcenterprise/msg/>

b. Downloading the firmware program

Contact the field engineer.

The following files or document are provided.

- i. Firmware program file (XSCF Control Package (XCP) file)
- ii. XSCF extension MIB definition file

Note – XSCF Control Package (XCP) : XCP is a package which has the control programs of hardware that configures a computing system. The XSCF firmware and the OpenBoot PROM firmware are included in the XCP file.

- c. Fault Management MIB (SUN-FM-MIB) definition file

http://src.opensolaris.org/source/xref/onnv/onnv-gate/usr/src/lib/fm/libfmd_snmp/mibs/

- d. Solaris Operating System Related Manuals

<http://docs.sun.com>

Abbreviated References to Other Documents

In this manual, the following abbreviated titles may be used when referring to a systems manual. The following table lists the abbreviations used in this manual.

Abbreviated Title	Full Title
Overview Guide	SPARC Enterprise M4000/M5000 Servers Overview Guide SPARC Enterprise M8000/M9000 Servers Overview Guide
Service Manual	SPARC Enterprise M4000/M5000 Servers Service Manual SPARC Enterprise M8000/M9000 Servers Service Manual
Installation Guide	SPARC Enterprise M4000/M5000 Servers Installation Guide SPARC Enterprise M8000/M9000 Servers Installation Guide
Administration Guide	SPARC Enterprise M4000/M5000/M8000/M9000 Servers Administration Guide
XSCF Reference Manual	SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF Reference Manual
XSCF User's Guide	SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide

Models

The model names used in this manual are as follows.

Server class	Model name
Midrange	SPARC Enterprise M4000
	SPARC Enterprise M5000
High-end	SPARC Enterprise M8000
	SPARC Enterprise M9000

Text Conventions

This manual uses the following fonts and symbols to express specific types of information.

Fonts/symbols	Meaning	Example
AaBbCc123	What you type, when contrasted with on-screen computer output. This font represents the example of command input in the frame.	XSCF> adduser jsmith
AaBbCc123	The names of commands, files, and directories; on-screen computer output. This font represents the example of command input in the frame.	User Name: jsmith Privileges: useradm auditadm
<i>Italic</i>	Indicates the name of a reference manual	See the <i>XSCF User's Guide</i> .
" "	Indicates names of chapters, sections, items, buttons, or menus	See Chapter 2, "Preparation for Installation."

Prompt Notations

The prompt notations used in this manual are as follows.

Shell	Prompt Notations
XSCF	XSCF>
C shell	<i>machine-name%</i>
C shell super user	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell super user	#
OpenBoot PROM	ok

Syntax of the Command Line Interface (CLI)

The command syntax is described below.

Command syntax

The command syntax is as follows:

- A variable that requires input of a value must be enclosed in <>.
- An optional element must be enclosed in [].
- A group of options for an optional keyword must be enclosed in [] and delimited by |.
- A group of options for a mandatory keyword must be enclosed in {} and delimited by |.

- The command syntax is shown in a frame such as this one.

Example::

```
XSCF> showuser -a
```

Software License

The function to explain in this manual uses the softwares of GPL,LGPL and others. For the information of the license, see Appendix E, "Software License Condition" in *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

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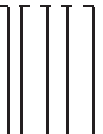
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Overview of Dynamic Reconfiguration

This chapter provides an overview of Dynamic Reconfiguration, which is controlled by the eXtended System Control Facility (XSCF).

1.1 DR

Dynamic Reconfiguration (referred to as DR, in this document) enables hardware resources such as processors, memory, and I/O to be added and deleted even while the Solaris TM Operating System (referred to as OS, in this document) is running.

DR has three basic functions; i.e., addition, deletion and move, which can be used for the following purposes.

- Add system boards without stopping the Solaris OS of the domain, to improve business operations or handle higher system loads.
- Temporarily remove a faulty system board for parts replacement without stopping the Solaris OS of the domain, in the event of an error that causes the system board to become degraded.
- Move a resource from one domain to another while continuously operating the domains without physically removing or inserting a system board. Resources can be moved to balance the loads on multiple domains, or to share common I/O resources between domains.

SPARC Enterprise M4000/M5000/M8000/M9000 servers have a unique partitioning feature that can divide one physical system board (PSB) into one logical board (undivided status) or four logical boards. A PSB that is logically divided into one board (undivided status) is called a Uni-XSB, whereas a PSB that is logically divided

into four boards is called a Quad-XSB. Each composition of physical unit of the divided PSB is called an eXtended System Board (XSB). These XSBs can be combined freely to create domains.

DR functions on these servers are performed on an XSB. This manual uses the term *system board* unless physical units of PSB and XSB are described. For an explanation of each term, see [TABLE 1-2](#).

Note – This document explains DR functions on system boards. Use the Solaris command `cfgadm(1)` to execute DR on I/O devices, including PCI cards. For more information, please see the service manual for your system, and the `cfgadm(1M)` and `cfgadm_pci(1M)` man pages.

FIGURE 1-1 Uni-XSB and Quad-XSB (Midrange Servers)

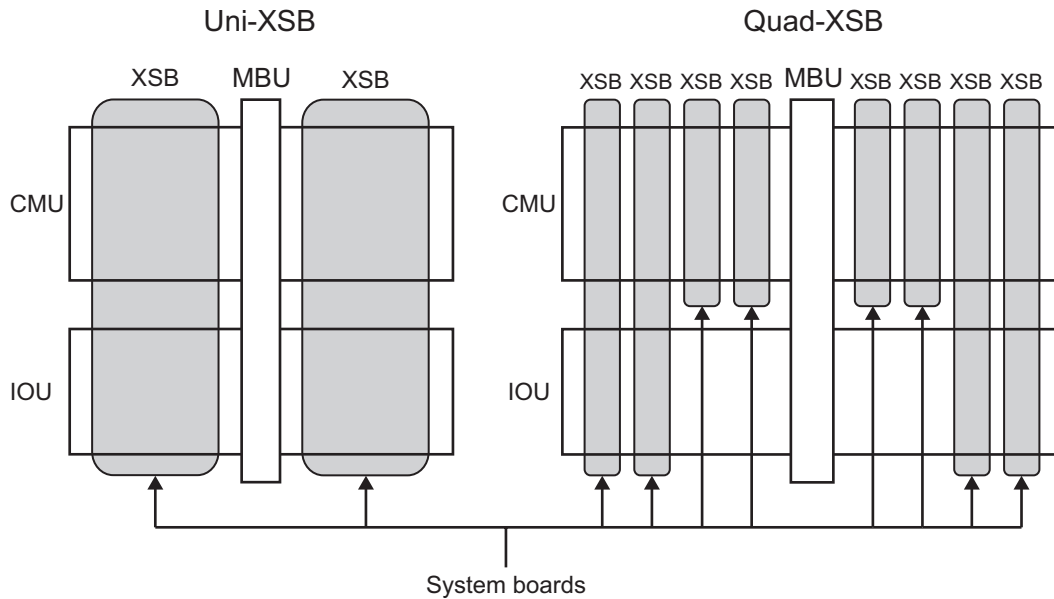


FIGURE 1-2 Uni-XSB and Quad-XSB (High-end Servers)

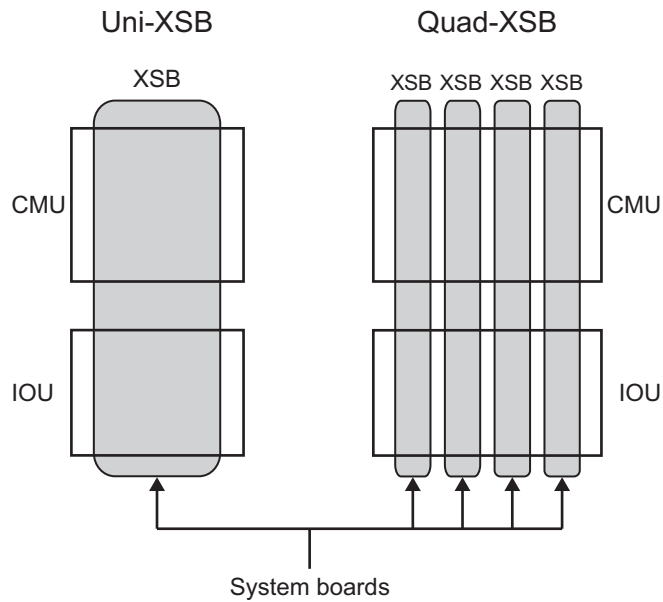


TABLE 1-1 and TABLE 1-2 list DR-related terms.

TABLE 1-1 Basic DR Terms

Term	Definition
Add	To connect a system board to a domain and configure it into the Solaris OS of the domain.
Delete	To unconfigure a system board from the Solaris OS of a domain and disconnect it from the domain.
Move	To disconnect a system board from a domain and then connect the system board to another domain.
Register	To register a system board in the domain component list (hereinafter called DCL).
Release	To delete a registered system board from the DCL.
Assign	To assign a system board to a domain.
Unassign	To release a system board from a domain.
Connect	To connect a system board to a domain.
Disconnect	To disconnect a system board from a domain.
Configure	To configure a system board in the Solaris OS.

TABLE 1-1 Basic DR Terms

Term	Definition
Unconfigure	To unconfigure a system board in the Solaris OS.
Reserve	To reserve a system board such that it is assigned to or unassigned from a domain on the next reboot or power-cycle.
Install	To insert a system board into a system.
Remove	To remove a system board from a system.
Replace	To remove a system board and then mount it or a new system board, for system maintenance and inspection.

TABLE 1-2 Terms Related to Hardware Configurations

Term	Definition
CPU/Memory board unit (CMU)	Unit equipped with a CPU module, and memory. High-end servers only.
Motherboard Unit (MBU)	Unit for midrange servers. A CMU is mounted on this board. Midrange servers only.
I/O board unit (IOU)	Unit equipped with a PCI card and a disk drive unit.
Physical System Board (PSB)	The PSB is made up of physical components, and can include 1 CMU and 1 IOU or just 1 CMU. In midrange servers, the CMU is mounted on a MBU. A PSB also can be used to describe a physical unit for addition/deletion/exchange of hardware. The PSB can be used in one of two methods, one complete unit (undivided status) or divided into four subunits.
eXtended System Board (XSB)	The XSB is made of physical components. In the XSB, the PSB can be either one complete unit (undivided status) or divided into four subunits. The XSB is a unit used for domain construction and identification, and also can be used as a logical unit.
Logical System Board (LSB)	A logical unit name assigned to an XSB. Each domain has its own set of LSB assignments. LSB numbers are used to control how resources such as kernel memory get allocated within domains.

TABLE 1-2 Terms Related to Hardware Configurations (*Continued*)

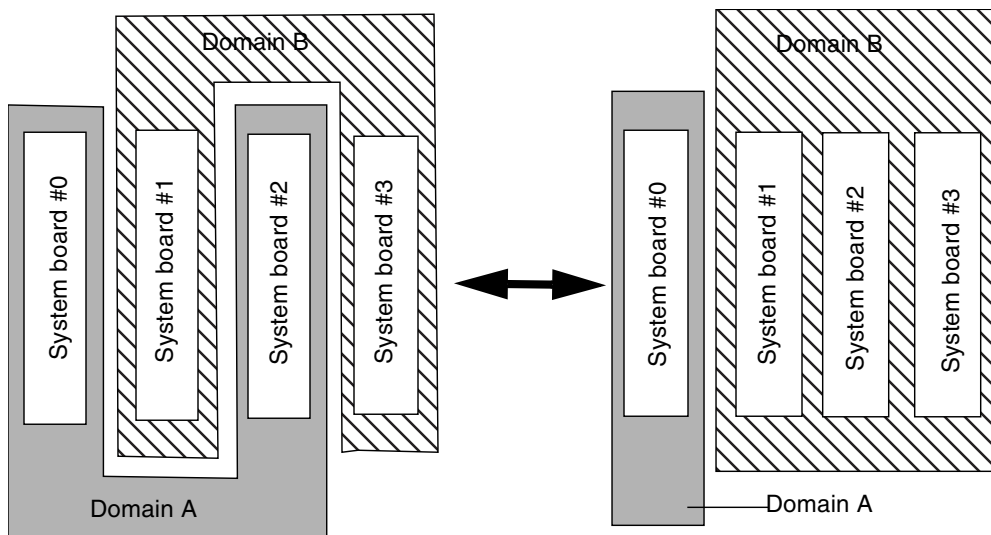
Term	Definition
System board	The hardware resources of a PSB or an XSB. A System board is used to describe the hardware resources for operations such as domain construction and identification. In this manual, this refers to the XSB.
Uni-XSB	One of the division types of a PSB. Uni-XSB is a name for when a PSB is logically only one unit (undivided status). It is a default value setting for the division type for a PSB. The division type can be changed by using the XSCF command <code>setupfru(8)</code> . Uni-XSB may be used to describe a PSB division type or status.
Quad-XSB	One of the division types of a PSB. Quad-XSB is a name for when a PSB is logically divided into four parts. The division type can be changed by using the XSCF command <code>setupfru(8)</code> . Quad-XSB may be used to describe a PSB division type or status.

1.2 Basic DR Functions

This section describes the basic DR functions.

FIGURE 1-3 shows DR processing.

FIGURE 1-3 DR Processing Flow



In the example shown in [FIGURE 1-3](#), system board #2 is deleted from domain A and added to domain B. In this way, the physical configuration of the hardware (mounting locations) is not changed but the logical configuration is changed for management of the system boards.

1.2.1 Adding a System Board

You can use DR to add a system board to a domain provided that board is installed in the system and not assigned to another domain. You can do so without stopping the Solaris OS running in the domain.

A system board is added in such stages as connect, and configure.

In the add operation, the selected system board is connected to the target domain. Then, the system board is configured to the Solaris OS of the domain. At this point, addition of the system board is completed.

1.2.2 Deleting a System Board

You can use DR to delete a system board from a domain without stopping the Solaris OS running in that domain.

A system board is deleted in such stages as unconfigure and disconnect. If the board must be assigned to another domain, the delete operation must also include an unassign step.

In the delete operation, the selected system board is unconfigured from its domain by the Solaris OS. Then, the board is disconnected from the domain. At this point, deletion of the system board is completed.

1.2.3 Moving a System Board

You can use DR to reassign a system board from one domain to another without stopping the Solaris OS running in either domain.

This move function can change the configurations of both domains without physical removal and remounting of the system board.

The move operation for a system board is a serial combination of the “delete” and “add” operations. In other words, the selected system board is deleted from its domain and then added to the target domain.

1.2.4 Replacing a System Board

You can use DR to remove a system board from a domain and either add it back later, or replace it with another system board, provided both boards satisfy DR requirements as described in this document. You can do so without stopping the Solaris OS running in either domain.

You can replace system board in the case of exchanging hardware resources such as CPUs, memory, I/O devices.

A system board is replaced successively in stages.

In the replace operation, the selected system board is deleted from the OS of the domain. Then, the system board is removed when it is ready to be released from its domain. After field parts replacement or other such task, the system board is re-installed and added.

Note – You cannot use DR to replace a system board in a midrange server because doing so would replace an MBU. To replace a system board in a midrange server, you must turn off the power of all domains, then replace the board without using DR commands.

1.3 Security

DR operations are executed based on privileges. For information about privileges and user accounts, see the *SPARC Enterprise M4000/M5000/M8000/M9000 Servers Administration Guide*.

1.4 Overview of DR User Interfaces

DR operations are performed through the command line interface (CLI) within the XSCF shell or through the browser-based user interface (BUI) in the XSCF Web provided by the eXtended System Control Facility (XSCF). These operations are collectively managed by the XSCF. Furthermore, XSCF security management restricts DR operations to administrators who have the proper access privileges.

For details of XSCF shell commands provided for DR, see [Section 3.1, “How To Use the DR User Interface” on page 3-1](#). XSCF Web is beyond the scope of this document. See the *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User’s Guide* for further information.

What You Must Know Before Using DR

This chapter provides information you must know to successfully use the DR functions.

2.1 System Configuration

This section describes the conditions, premises, and actions for operating the DR functions to construct a system.

2.1.1 System Board Components

There are three types of system board components that can be added and deleted by DR: CPU, memory, and I/O device. [FIGURE 2-1](#) and [FIGURE 2-2](#) show examples of a system board of a midrange server that is divided into one Uni-XSB, and into Quad-XSBs. [FIGURE 2-3](#) and [FIGURE 2-4](#) show examples of a system board of a high-end server that is divided into one Uni-XSB, and into Quad-XSBs.

Note – Due to diagnostic requirements, the DR function works only on boards that have at least one CPU and memory.

FIGURE 2-1 Example of Hardware Configuration (with Uni-XSB of Midrange Server)

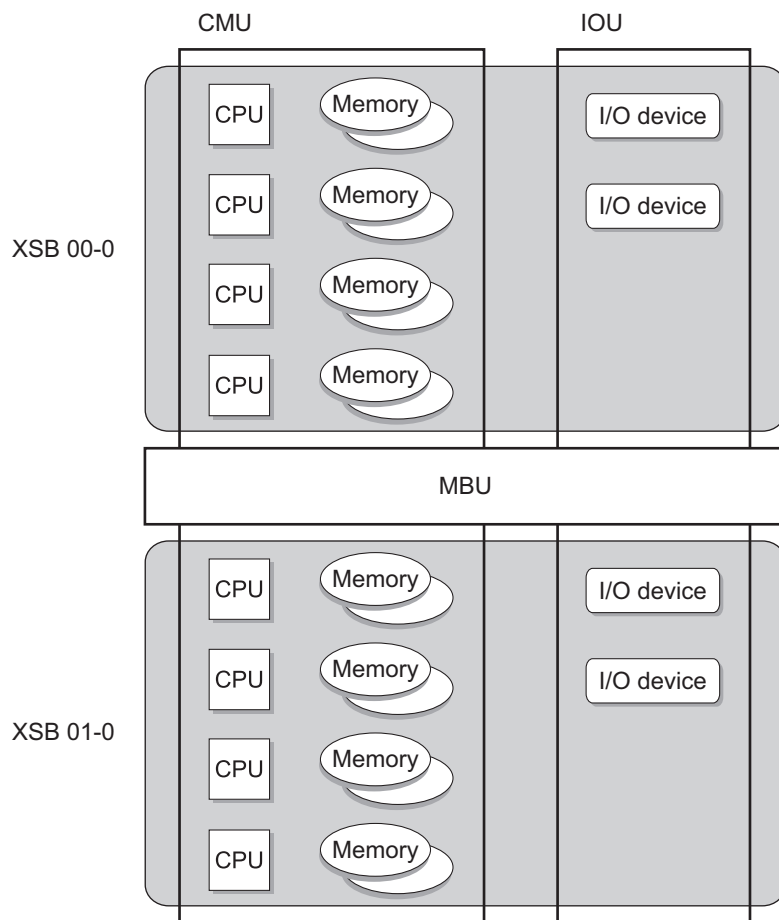


FIGURE 2-2 Example of Hardware Configuration (with Quad-XSBs of Midrange Server)

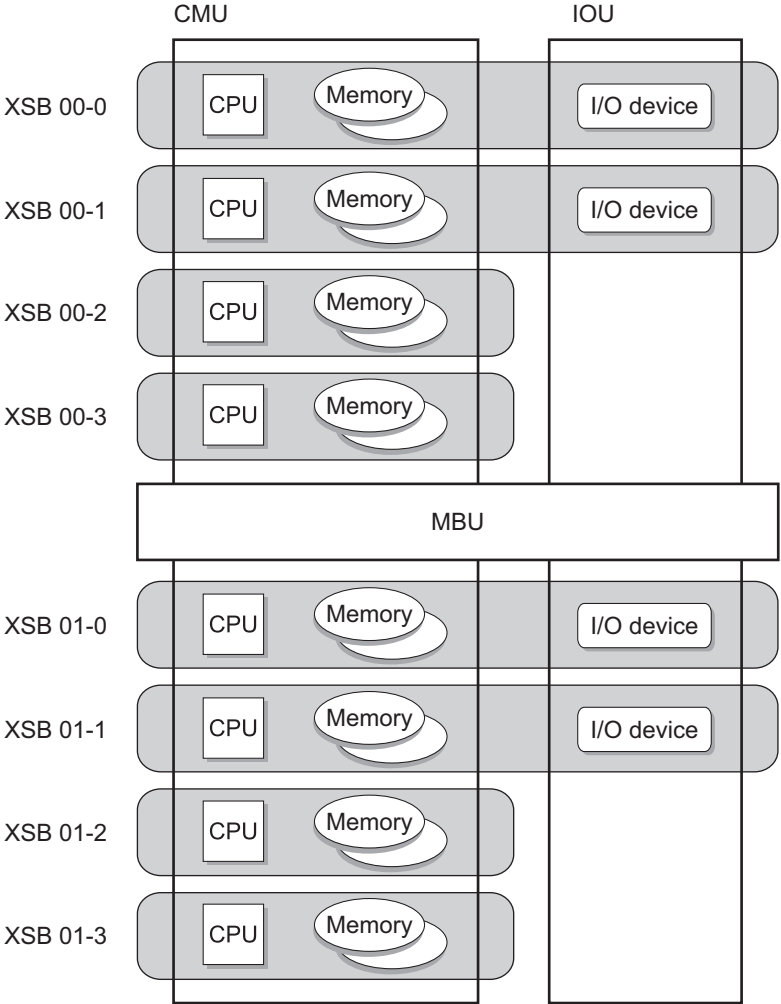


FIGURE 2-3 Example of a Hardware Configuration (with Uni-XSBs of High-end Server)

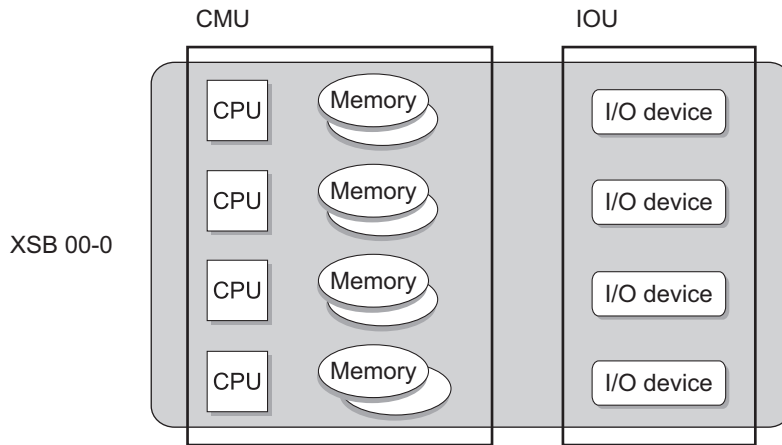
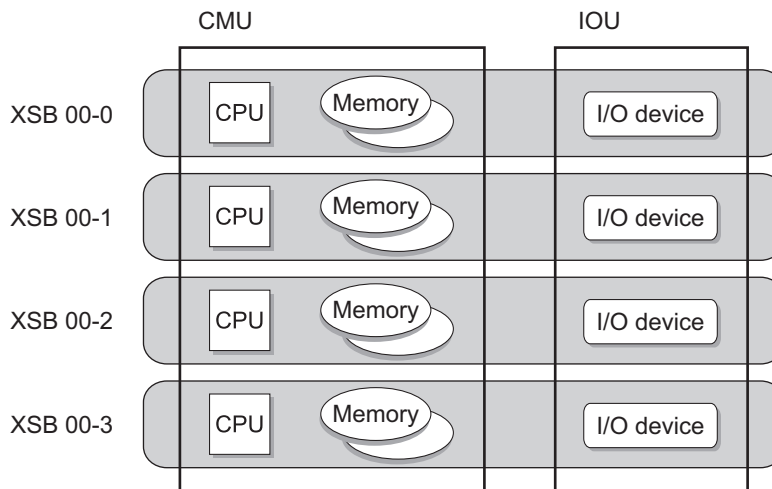


FIGURE 2-4 Example of a Hardware Configuration (with Quad-XSBs of High-end Server)



2.1.1.1 CPU

Using DR to change a CPU configuration is easier than using it to change the configuration of memory or an I/O device.

An added CPU is automatically recognized by the Solaris OS and becomes available for use.

A CPU to be deleted must meet the following conditions:

- No running process is bound to the CPU to be deleted. If a running process is bound to the target CPU, you must unbind or stop the process.
- The CPU to be deleted does not belong to any processor set. If the target processor belongs to a processor set, you must delete the CPU from the processor set by using the `psrset(1M)` command.
- If the resource pools facility is in use by the domain, the CPU cannot be deleted unless the minimum processor set sizes can otherwise be maintained. Use the Solaris commands `pooladm(1M)` and `poolcfg(1M)` to check these parameters and, if necessary, adjust the sizes of the domain's resource pools.

Note – These conditions also apply to movement of a system board.

If any of the above conditions are not met, the DR operation is stopped and a message is displayed. However, if you specify the `deleteboard(8)` command with the `-f` (force) option, these protections are ignored and DR continues the deletion process.

Note – Exercise care when using the force option, as doing so introduces risk of domain failure.

To avoid this problem and automate the operations for CPUs, the Solaris OS provides the Reconfiguration and Coordination Manager (RCM) script function. For details of RCM, see [Section 3.4, “RCM Script” on page 3-27](#).

2.1.1.2 Memory

The DR functions classify system boards by memory usage into two types:

- Kernel memory board
- User memory board

(1) Kernel Memory Board

A kernel memory board is a system board on which kernel memory (memory internally used by the Solaris OS and containing an OpenBoot PROM program) is loaded. Kernel memory cannot be removed from the system. But the location of kernel memory can be controlled, and kernel memory can be copied from one board to another.

- To control whether a system board contains kernel memory, use one or more of the following features, which are described below: kernel cage, floating boards, and kernel memory assignment.
- To copy kernel memory from one board to another, use the Copy-rename operation. Copy-rename makes it possible for you to perform DR operations on kernel memory boards.

(1.1) Kernel Cage

The kernel cage function must be in use for DR operations on memory to succeed. Without the kernel cage, kernel memory could be assigned to all system boards, making it impossible to perform DR operations on memory. With the kernel cage, kernel memory is limited to a minimum set of system boards.

For details on enabling this function, see [Section 2.3.2, “Settings of Kernel Cage Memory” on page 2-16](#).

(1.2) Floating Boards

A floating board is a system board that is designated to be moved easily to another domain. In general, kernel memory is not assigned to a floating board unless absolutely necessary.

However, kernel memory can be assigned to a floating board when one of the following is true:

- The total amount of space available among non-floating boards is not enough to hold the kernel memory.
- The `deleteboard(8)` command is used with its `-f` (force) option.

For details on enabling the floating board option for a system board, see [Section 2.2.2.2, “Floating Board Option” on page 2-14](#). Also see the *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide* or the `setdcl(8)` man page for further details.

(1.3) Kernel Memory Assignment

When a domain is powered on, the Power On Self Test (POST) initially assigns an address space to each system board in that domain. The order in which address spaces are assigned depends on the LSB number and floating board option of each system board. The first address spaces are assigned to non-floating boards in ascending order of LSB number. Then, additional address spaces are assigned to floating boards, again in ascending order of their LSB numbers.

When the kernel cage is enabled, kernel memory is assigned to system boards in the order of their address spaces. The kernel cage begins in the first address space (which initially corresponds to the non-floating board with the lowest LSB number). If the kernel requires more memory, then the kernel cage expands to the next address space (which initially corresponds to the non-floating board with the next-lowest LSB number), and so on. The kernel cage extends into the address spaces of floating boards only if kernel memory is too large to fit in the address spaces of the non-floating boards.

Note – During a copy-rename operation, the address spaces initially assigned by POST are exchanged between system boards. The effects of this process persist through reboots of a domain. Therefore, kernel memory may be assigned in a seemingly different order until the domain has gone through a full `poweroff(8)` and `poweron(8)` cycle, as this pair of operations cancels the effects of copy-rename operations.

For details on assigning LSB numbers to system boards, see the '*SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide*' or the `setdcl(8)` man page.

(1.4) Copy-rename

Kernel memory itself cannot be removed, but it can be transferred to another system board. A DR operation to delete a kernel memory board must first perform this transfer, which is called a copy-rename operation.

The Solaris OS selects the target for the copy-rename operation from among the available user memory boards. The following selection and preference criteria are in effect:

- The copy-destination board must not yet contain any kernel memory. (It must be a user memory board.)
- The copy-destination board must not be a floating board, unless the `-f` (force) option is used with the `deleteboard(8)` command.
- The copy-destination board must contain at least as much physical memory as the system board being deleted.
- If more than one system board satisfies all the selection criteria to the same degree of satisfaction, the one with the lowest LSB number is selected as the copy-destination board.

Note – If no system boards meet the selection criteria, the DR operation to delete the kernel memory board will fail.

Once the copy-destination board has been selected, the Solaris OS performs a memory deletion on the selected user memory board.

Then, the kernel memory on the system board to be deleted is copied into memory on the selected copy-destination system board. The system is suspended while the copying is in progress. After all the memory is copied, the address space of the copy-destination board is renamed to that of the kernel memory board being deleted.

Note – If the address space of a system board is renamed by a copy-rename operation, the change will persist across reboots of the domain. A `poweroff(8)/poweron(8)` cycle of the domain will reset the address space assignments and remove the effects of one or more copy-rename operations.

(2) User Memory Board

A user memory board is a system board on which no kernel memory is loaded. Before deleting user memory, the system attempts to swap out the physical pages to the swap area. Sufficient swap space must be available for this operation to succeed.

(2.1) Locked Pages and ISM Pages

Some user pages are locked into memory and cannot be swapped out. These pages receive special treatment by DR.

Intimate Shared Memory (ISM) pages are special user pages which are shared by all processes. ISM pages are permanently locked and cannot be swapped out as memory pages. ISM is usually used by Data Base Management System (DBMS) software to achieve better performance.

Although locked pages cannot be swapped out, the system automatically moves them to the memory on another system board to avoid any problem concerning the pages. Note, however, that the deletion of user memory fails if there is not sufficient free memory size on the remaining system boards to hold the relocated pages.

Although such moving of memory (called *save processing*) requires a certain length of time, system operations can continue during save processing because it is executed as a background task.

Note – The Dynamic Intimate Shared Memory (DISM) is a feature that allows applications to dynamically resize their ISM segments. Some applications use RCM scripts to resize their DISM segments to assist DR. See the Solaris man page for `rcmscript(4)`.

Deleting or moving a user memory board fails if either of the following statements is true:

- The swap area does not have sufficient free space to save data from the user memory to be deleted.
- There are too many locked or ISM pages to be covered by the memory on other system boards.

2.1.1.3 I/O Device

(1) Adding an I/O Device

The device driver processing executed by the Solaris OS is based on the premise that all device drivers dynamically recognize newly added devices. In the domain where DR is performed, all device drivers must support the addition of devices by DR. Upon the addition of an I/O device by DR, the I/O device is reconfigured automatically.

The path name of a device file under `/dev` is configured as the path name of the newly added I/O device to make the I/O device accessible.

(2) Deleting an I/O Device

An I/O device can be deleted when both of the following conditions are met:

- The device to be deleted is not in use in the domain where the DR operation is to be performed.
- The device drivers in the domain where the DR operation is to be performed support DR.

In most cases the device to be deleted is in use. For example, the root file system or any other file systems requisite for operation cannot be unmounted.

To solve this problem, you can configure the system by using redundant configuration software to make the access path to each requisite I/O device redundant. For a disk drive unit, you can make the unit redundant by using disk mirroring software.

If a device driver that does not support DR is used in the domain, all access to I/O devices controlled by the device driver must be stopped, and the device driver must be unloaded by using the `modunload(1M)` command.

Note – Do not move a device that is part of a redundant configuration from one domain to another domain. The consequences of two domains simultaneously accessing the same device through different paths could be disastrous, such as data corruption.

2.1.2 System Board Configuration Requirements

XSCF enables the Uni-XSB or Quad-XSB setting according to the configuration conditions to determine the division type. If the CPU or memory configuration does not meet the configuration conditions, neither Uni-XSB nor Quad-XSB can be set as the division type.

For the CPU configuration and memory configuration conditions set for the division types, refer to the System Overview for your system.

The setting of division type may be changed for DR operation if a domain operation requirement dictates changing of a necessary hardware resource when a system board is added to the domain.

In such cases, the CPU configuration and memory configuration conditions for changing the division type are the same as described above. For the conditions, refer to the System Overview for your system.

Note – Changing the division type before a DR operation may not be possible depending on the system board status or DR operation, even if configuration conditions have been met.

2.1.3 System Board Pool Function

The system board pooling function places a specific system board in the status where that board does not belong to any domain.

This function can be effectively used to move a system board among multiple domains as needed.

For example, a system board can be added from the system board pool to a domain where CPU or memory has a high load. When the added system board becomes unnecessary, the system board can be returned to the system board pool.

All system boards that are targets of DR operations must be registered in the target domain's Domain Component List (DCL). A domain's DCL, managed by XSCF, is a list of system boards that are, or are to be, attached to that domain. The DCL of each domain contains not only information of registered system boards but also domain information and option information of each system board.

Moreover, a system board that is pooled can be assigned to a domain only when it is registered on DCL. Pooled system boards must be properly managed.

You can add and delete system boards by combining the system board pooling function with the floating board, omit-memory, and omit-I/O options described in [Section 2.2, “Conditions and Settings Using XSCF” on page 2-12](#).

2.1.4 Checklists for System Configuration

This section describes the prerequisites and the checklists for configuring the system for DR.

1. Redundant Configuration of I/O Devices - Before a system board can be replaced, any I/O device connected to that board must be temporarily disconnected.

You should use redundant-configuration software to prevent any problem that might be caused by disconnection of an I/O device that would affect a job process. You should also confirm that the driver and software support DR before performing a DR operation.

2. Selection of PCI Cards Supporting DR - All PCI cards and I/O device interfaces on a system board must support DR. If not, you cannot execute DR operations on that system board. You must turn off the power supply to the domain before performing maintenance and installation.
3. Confirmation of DR Compliance of Drivers and Other Software - You must confirm that all I/O device drivers and software installed in the system support DR and allow the I/O device operations of DR.

You should also apply the latest patches to the drivers and other software before performing DR.

4. Allocation of Sufficient Memory and Distributed Swap Areas - You must allocate sufficient memory resources to be used when the memory on a system board is disconnected. Performing a DR operation with a high load already applied to memory may significantly lower job process performance and DR operability.
5. Consideration of Hardware Configuration and System Boards on Which Kernel Memory is Loaded - Before determining the hardware configuration and operations, you must understand how job processes are affected by DR operations on system boards on which CPUs, memory, and I/O devices are mounted.

You can perform DR operations on system boards that contain kernel memory. When disconnecting a system board on which kernel memory is loaded, DR copies kernel memory into the memory on another system board. The copy operation is based on the premise that the copy-destination system board does not already contain any kernel memory.

When kernel memory is copied, the Solaris OS is temporarily suspended. Therefore, you must understand the effect of disconnecting the network connection with remote systems and other influences of the DR operation on job processes before determining system operations.

2.1.5 Reservation of Domain Configuration Changes

Besides letting you add, delete, or move system boards dynamically, DR also lets you order such reconfiguration to take place the next time the affected domains are turned on or turned off, or the domain is rebooted. Use the `addboard(8)`, `deleteboard(8)`, or `moveboard(8)` command with the `-c reserve` option to specify these actions.

Some of the reasons you might want to reserve a domain change include:

- A hardware resource cannot be dynamically reconfigured by DR for business or operational reasons.
- Domain configuration settings should not be immediately changed.
- You want to avoid changing the current domain configuration settings and change the configuration immediately after the domain is rebooted when necessary to delete a system board having a driver or PCI card that does not support DR.
- You want to assign a floating board to a specific domain beforehand to prevent the system board from being acquired by another domain.

For how to reserve domain changes, see [Section 3.1.10, “Reserving a Domain Configuration Change” on page 3-24](#).

2.2 Conditions and Settings Using XSCF

This section describes the operating conditions required for XSCF to start DR operations and the settings that are established by XSCF.

2.2.1 Conditions Using XSCF

The DR operation to add a system board cannot be executed when the system board has only been mounted. The DR operation is enabled by registering the system board in the DCL by using the XSCF shell or XSCF Web. You must confirm that the system board to be added is registered in the DCL before performing the DR

operation.

As a matter of course, system boards to be deleted, moved, or replaced have already been registered in the DCL. You need not confirm that these boards have been registered in the DCL.

For details about the DCL and how to register system boards in the DCL and to confirm registration, refer to *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

2.2.2 Settings Using XSCF

The DR functions provide users with some options to avoid the complexities of reconfiguration and memory allocation with the Solaris OS, and make DR operations smoother. You can set up these options using the XSCF shell or XSCF Web. This section describes the following options:

- Configuration policy option
- Floating board option
- Omit-memory option
- Omit-I/O option

For details of how to set up the options, refer to *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide* or the `setdcl(8)` man page.

2.2.2.1 Configuration Policy Option

DR operations involve automatic hardware diagnosis to add or move a system board safely. Degradation of components occurs when the components are set according to the configuration of this option, and a hardware error is detected. This option specifies the range of degradation. Moreover, this option can be used for initial diagnosis by domain startup in addition to DR operations.

The unit of degradation can be a component where a hardware error is detected, the system board (XSB) where the component is mounted, or a domain.

This option is set using `setdcl(8)` command. Values that can be set and units of degradation is explained in [TABLE 2-1](#).

The default value of the configuration policy option is FRU.

Note – Enable the configuration policy option when the power supply of the domain is turned off.

TABLE 2-1 Unit of Degradation

Value	Unit of degradation
FRU	Hardware is degraded in units of components such as CPU and memory.
XSB	Hardware is degraded in units of system boards (XSB).
System	Hardware is degraded in units of domains or the relevant domain is stopped without degradation.

2.2.2.2 Floating Board Option

The floating board option controls kernel memory allocation.

Upon deletion of a system board on which kernel memory is loaded, the OS is temporarily suspended. The suspended status affects job processes and may disable DR operations. To avoid this problem, use the floating board option to set the priority of kernel loading into the memory of each system board, which increases the likelihood of successful DR operations.

To move a system board among multiple domains, this option can be enabled for the system board to facilitate the system board move.

The value of this option is “true” (to enable the floating board setting) or “false” (to disable the floating board setting). The default is “false”.

A system board with “true” set for this option is called a floating board. A system board with “false” set for this option is called a non-floating board.

Kernel memory is allocated to the non-floating boards in a domain by priority in ascending order of LSB number. When only floating boards are set in the domain, one of them is selected and used as a kernel memory board. In that case, the status of the board is changed from floating board to non-floating board. When Copy-rename is operated by system board deletion or removal, and only floating board can be used because non-floating board cannot be used, specify the force option (-f). Configuration of floating board option does not change when the force option is used.

Note – Enable the floating board option when the system board is in the system board pool or when the system board is not connected to the domain configuration.

2.2.2.3 Omit-memory Option

When the omit-memory option is enabled, the memory on a system board cannot be used in the domain.

Even when a system board actually has memory, this option enables you to make the memory on the system board unavailable through a DR operation to add or move the system board.

This option can be used when the target domain needs only the CPU (and not the memory) of the system board to be added.

If a domain has a high load on memory, an attempt to delete a system board from the domain may fail. This failure results if a timeout occurs in memory deletion processing (saving of the memory of the system board to be disconnected onto a disk by paging) when many memory pages are locked because of high load. To prevent this situation, you can enable the omit-memory option to facilitate the DR operation beforehand.

Note – For diagnosis and management of a system board, memory must be mounted on the system board even if the omit-memory option is enabled. Enabling the omit-memory option reduces available memory in the domain and may lower system performance. This option must be used in consideration of the influence on jobs.

The value of this option is “true” (omit memory) or “false” (do not omit memory). The default value is “false”.

Note – Enable the omit-memory option when the system board is in the system board pool or when the system board is not connected to the domain configuration.

2.2.2.4 Omit-I/O Option

The omit-I/O option disables the PCI cards, disk drives, and basic local-area network (LAN) ports on a system board to prevent the target domain from using them.

Set this option to “true” if the domain needs to use only the system board’s CPU and memory.

Set this option to “false” if the domain needs to use the system board’s PCI cards and I/O units. In this case you must fully understand the restrictions on use of these I/O components. And you must stop the software (e.g. application programs or daemons) that uses them before you attempt to delete or move the system board.

The value of this option is “true” (omit I/O units) or “false” (do not omit I/O units). The default value is “false”.

Note – Enable the omit-I/O option when the system board is in the system board pool or when the system board is not connected to the domain configuration.

2.3 Conditions and Settings Using Solaris OS

This section describes the operating conditions and settings required for DR operations.

2.3.1 I/O and Software Requirements

As described in [Section 2.1, “System Configuration” on page 2-1](#), all I/O device drivers and software installed in a domain where DR is to be used must support DR. The device drivers that support DR must also support the following DDI and DKI entries:

`attach(9E): DDI_ATTACH and DDI_RESUME`

`detach(9E): DDI_DETACH and DDI_SUSPEND`

If a device driver that does not support DR is present, the deletion of a system board might fail.

Even if the DDI_DETACH interface is supported, DDI_DETACH processing fails when the relevant driver is in use. Before starting the deletion of a system board, you must stop using all devices on the system board to be deleted.

The device drivers that do not support DR must be unloaded before a system board is deleted. To unload a device driver, you must stop using all I/O devices controlled by the device driver. To unload a device driver, you can use the Solaris command `modunload(1M)`. Then, you can reload the driver for the remaining instances and resume using those remaining instances after deleting the system board.

2.3.2 Settings of Kernel Cage Memory

Kernel cage memory is a function used to minimize the number of system boards to which kernel memory is allocated. Kernel cage memory is enabled by default in the Solaris 10 OS.

If the kernel cage is disabled, the system may run more efficiently, but kernel memory will be spread among all boards and DR operations will not work on memory.

To determine whether kernel cage memory is enabled after the system has been rebooted, check the following message output from the `/var/adm/messages` file:

```
NOTICE: DR kernel Cage is ENABLED
```

If the kernel cage is disabled, the message will be:

```
NOTICE: DR kernel Cage is DISABLED
```

In most cases the kernel cage should be enabled. However, you must consider actual operations before changing the setting. If you do not need to perform DR operations, you do not need to enable the kernel cage.

To enable kernel cage memory, remove or comment out the following setting from the `/etc/system` file:

```
set kernel_cage_enable=0
```

The OS must be rebooted to make the new setting effective.

2.4 Status Management

The success of DR operations depends on the status of domains and system boards. This section describes the status information on the domains and system boards managed by XSCF, and the points to be noted for a better understanding of DR operation conditions.

2.4.1 Domain Status

XSCF manages the status of each domain.

You can display and reference the status of each domain through a user interface provided by XSCF. For details of the user interface, see [Chapter 3](#), DR User Interface.

XSCF manages the following aspects of domain status:

TABLE 2-2 Domain Status

Status	Description
Powered Off	Domain power is off.
Initialization Phase	POST processing or OpenBoot PROM initialization is in progress.
OpenBoot Executing Completed	Initialization of OpenBoot PROM is completed.
Booting	Solaris OS is being booted or, due to the domain being shutdown or reset, the system is in the OpenBoot PROM running state or is suspended in the OpenBoot PROM (ok prompt) state.
Running	Solaris OS is running.
Shutdown Started	Solaris OS is being shut down.
Panic State	Solaris OS has panicked.

To perform a DR operation for a system board, you must determine the method of DR operation according to the status of the relevant domain. The conditions of domain status available for DR operation are described in individual sections of [Chapter](#) , DR User Interface. For details of each method used for DR, see the relevant section.

2.4.2 System Board Status

XSCF manages system board status in units of XSB for the following management items:

TABLE 2-3 System Board Management Items

Management item	Description
Power	Power on/off status of system board
Test	Diagnostic status of system board
Assignment	Status of assignment to domain
Connectivity	Status of connection to domain
Configuration	Status of addition into Solaris OS

The table below lists the status types available for individual management items.

TABLE 2-4 System Board Management Items

Management item	Status	Description
Power	Power Off	The system board is powered off and cannot be used.
	Power On	The system board is powered on.
Test	unmount	The system board is not mounted or cannot be recognized, perhaps because it is faulty.
	unknown	The system board is not being diagnosed.
	testing	Testing
	passed	Passed
	failed	A system board error was detected and the board has been deconfigured.
Assignment	unavailable	The system board cannot be used. The reason might be one of the following: <ul style="list-style-type: none"> - The board is faulty. - The board is not listed in the domain's DCL. - The domain or board is not configured. - The board is assigned to another domain.
	available	The system board can be used and is registered in the domain's DCL. The system board is in this status when in the system board pool.
	assigned	The system board is reserved or assigned to the domain.
Connectivity	disconnected	The system board is disconnected from the domain configuration and is in the system board pool.
	connected	The system board is connected to the domain configuration.
Configuration	unconfigured	The hardware resources of the system board have been deleted from the Solaris OS.
	configured	The hardware resources of the system board have been added into the Solaris OS.

XSCF changes and configures system board status according to the conditions under which a system board is installed, removed, or registered in the DCL, or when a domain is started or stopped. System board status also changes when the system board is added, deleted, or moved by DR.

To perform a DR operation for a system board, you must determine the method of DR operation according to the status of the target system board. You can display and reference the status of each system board via a user interface provided by XSCF. For details of the user interface, see [Chapter 3](#), DR User Interface.

2.4.3 Flow of DR Processing

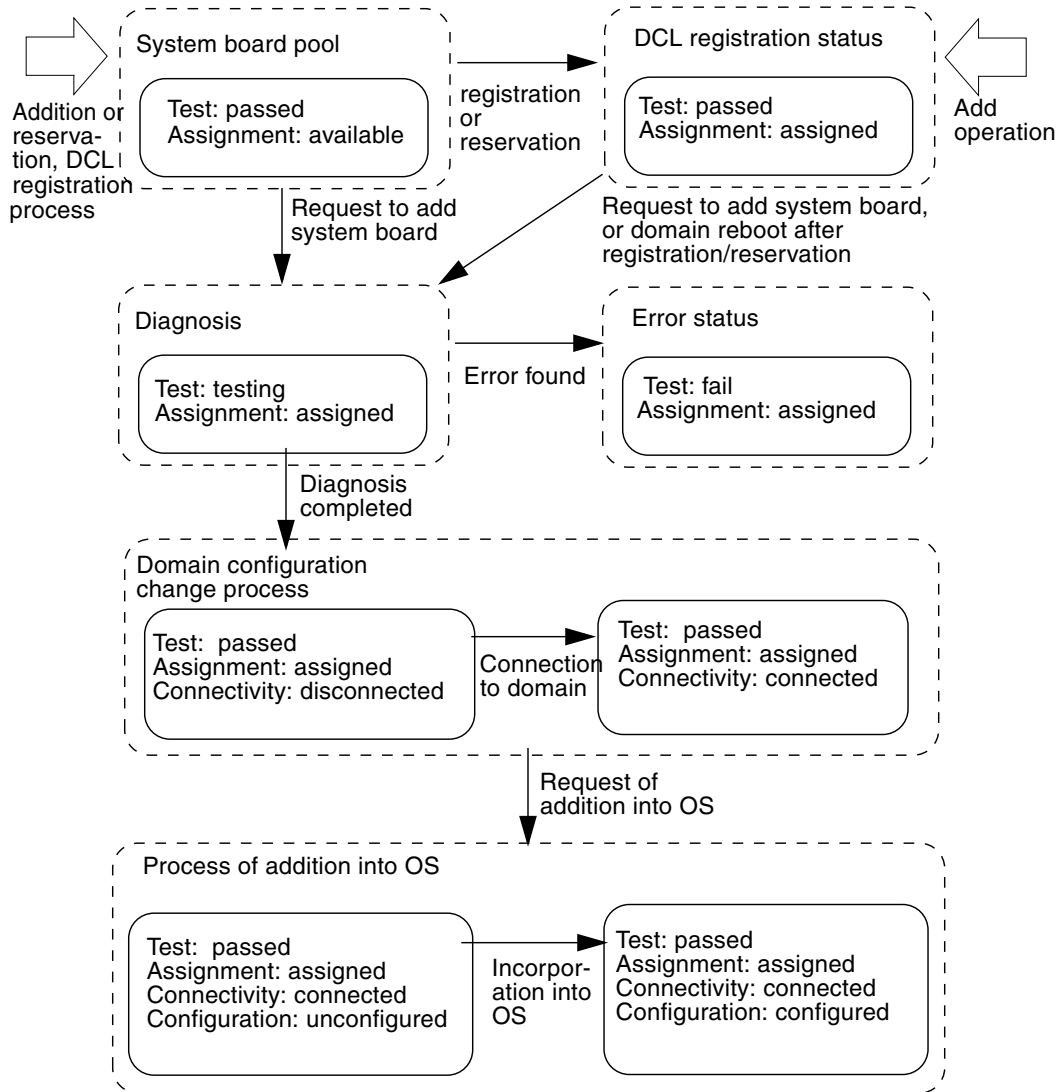
This section describes the flow of DR processing and the changes in system board status during individual DR operations.

2.4.3.1 Flowchart: Adding a System Board

The flow of DR operations and the transition of system board status when a system board has been added or reserved for addition are described in the schematic flowchart, below.

Each system board status indicated in [FIGURE 2-5](#) is the main status that is changed.

FIGURE 2-5 Flow of System Board Addition Processing

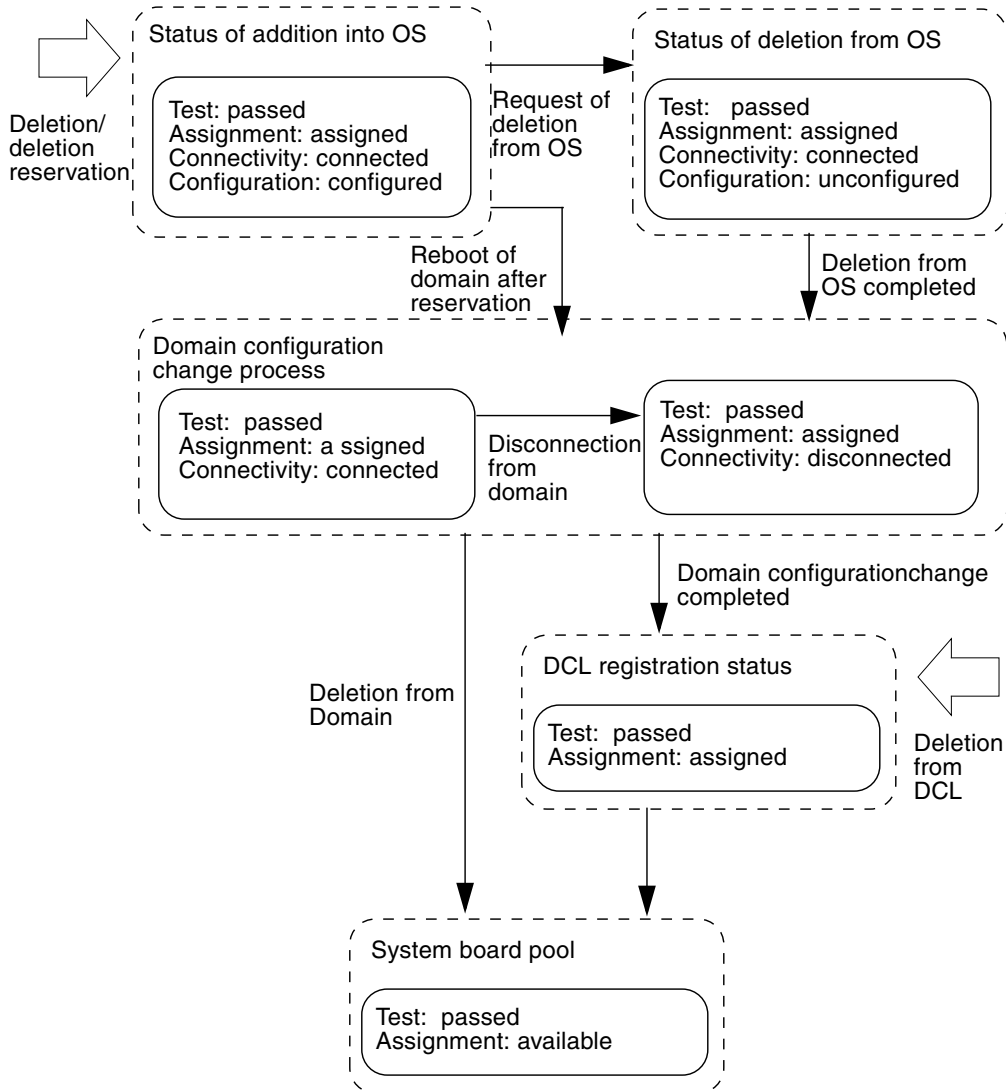


2.4.3.2 Flowchart: Deleting a System Board

The flow of DR operations and the transition of system board status when a system board has been deleted or reserved for deletion are described in the schematic flowchart, below.

Each system board status indicated in [FIGURE 2-6](#) is the main status that is changed.

FIGURE 2-6 Flow of System Board Deletion Processing



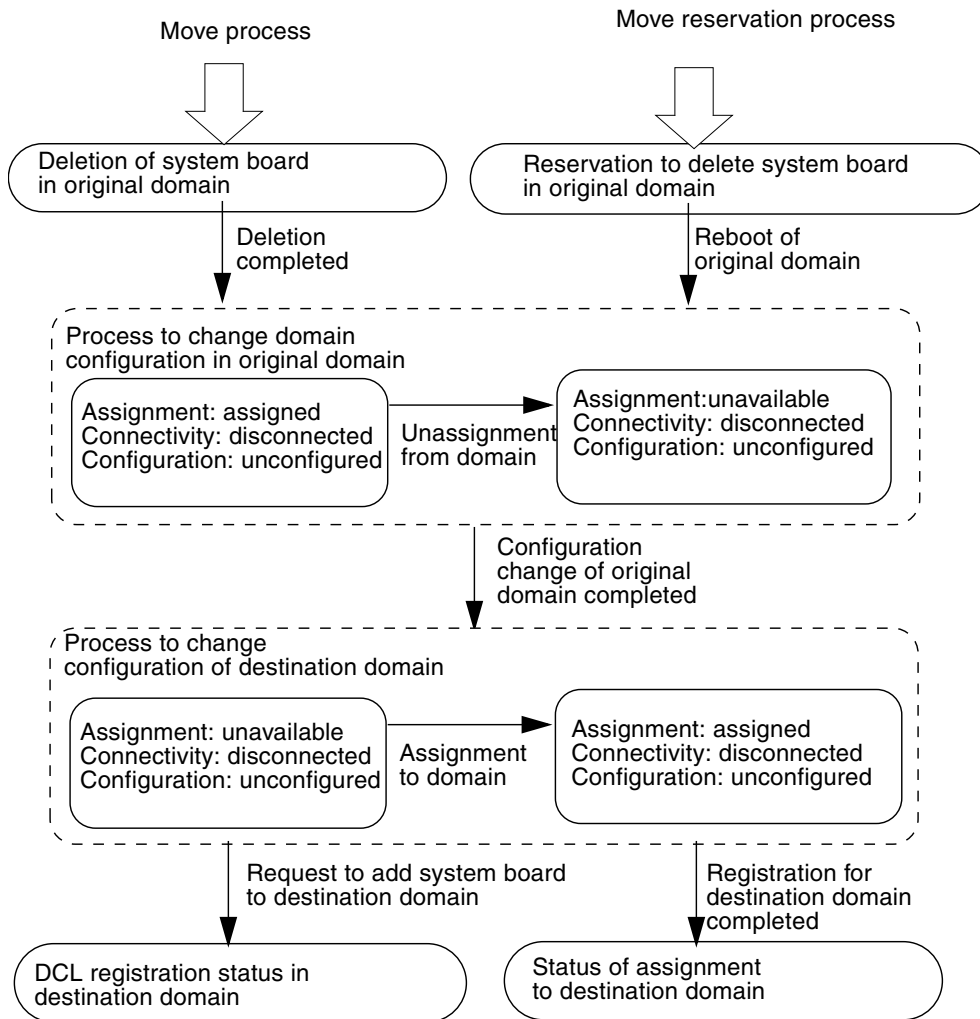
2.4.3.3 Flowchart: Moving a System Board

The flow of DR operations and the transition of system board status when a system board has been moved or reserved for a move are described in the schematic flowchart, below.

Each system board status indicated in [FIGURE 2-7](#) is the main status that is changed.

For the flow of system board addition processing or deletion processing and the related system board status, see [Section 2.4.3.1, “Flowchart: Adding a System Board” on page 2-20](#) or [Section 2.4.3.2, “Flowchart: Deleting a System Board” on page 2-21](#), respectively.

FIGURE 2-7 Flow of System Board Move Processing



2.4.3.4 Flowchart: Replacing System Board

The flow of DR operations and the transition of system board status when a system board has been replaced are described using the schematic flowchart.

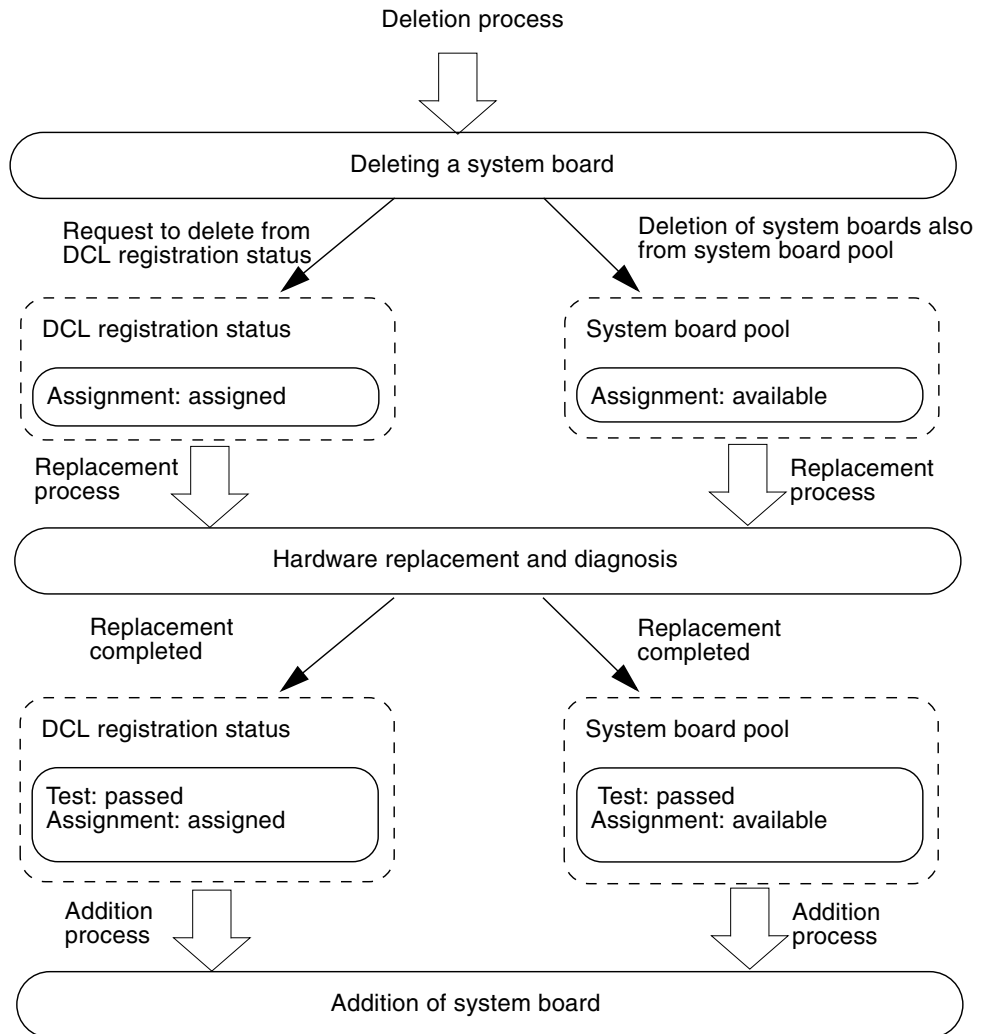
Each system board state indicated in [FIGURE 2-8](#) is the main status that is changed.

The sample status before and after replacement as shown in the figure are explained below. The actual status after hardware replacement may not match the indicated status.

For the flow of system board addition processing or deletion processing and the related system board status, see [Section 2.4.3.1, “Flowchart: Adding a System Board” on page 2-20](#) or [Section 2.4.3.2, “Flowchart: Deleting a System Board” on page 2-21](#), respectively.

For details of hardware replacement operations, see the service manual for your system.

FIGURE 2-8 Flow of System Board Replacement Processing



2.5 Operation Management

This section describes the premises and the actions for DR operations.

2.5.1 I/O Device Management

Upon the addition of a system board, device information is reconfigured automatically. However, addition of the system board and the reconfiguration of device information do not end at the same time.

Sometimes, device link in `/dev` directory is not automatically cleaned up by `devfsadm(1M)` daemon. Using `devfsadm(1M)`, you can manually clean up this device link. See the `devfsadm(1M)` Solaris man page for details.

2.5.2 Swap Area

The size of available virtual memory is the sum of the size of memory mounted in the system and the size of the swap area on the disk. You must ensure that the size of available memory is sufficient for all necessary operations.

2.5.2.1 Swap Area at System Board Addition

By default in Solaris, the swap area is also used to store a system crash dump. You should use a dedicated dump device, instead. See the Solaris man page `dumpadm(1M)`. The default swap area used to store the crash dump varies in size according to the size of mounted memory.

The size of the dump device used to store the crash dump must be larger than the size of mounted memory. When a system board is added, thereby increasing the size of mounted memory, the dump device must be reconfigured as required. For details, see the `dumpadm(1M)` Solaris man page.

2.5.2.2 Swap Area at System Board Deletion

When you delete a system board, the memory of the system board is swapped to the swap area of the disks. The available swap area is decreased by the memory size to be deleted. So, before you execute a delete board command, check the total swap area to verify that enough free swap space is available to hold the board's physical

memory contents. Be aware that some of the total swap space may be supplied by disks that are attached to the board to be deleted. When making your assessment, be certain to also account for the swap space that will be lost.

- If the size of available memory (e.g., 1.5 gigabytes) is larger than the size of deleted memory (e.g., 1 gigabytes), the total size of available memory will be 0.5 gigabytes after deleting the system board.
- If the size of available memory (e.g., 1.5 gigabytes) is smaller than the size of deleted memory (2 gigabytes), the attempt to delete the system board will fail.

To determine the size of currently available swap area, execute the `swap -s` command on the OS and verify that the memory size is marked *available*. For details, refer to the Solaris man page `swap(1M)`. Moreover, the size of physical memory of system board to be deleted and information on I/O devices connected can be confirmed by the `showdevices(8)` command. See Section 3.1.4, “Display Device Information” in [Chapter 3](#), DR User Interface, or the `showdevices(8)` man page. Refer to [Appendix B](#) for a more complete example.

2.5.3 Real-time Processes

The Solaris OS is temporarily suspended when a kernel memory board is deleted or moved. If your system has any real-time requirements (such as might be indicated by the presence of real-time processes), be aware that such a DR operation could significantly affect these processes.

2.5.4 Memory Mirror Mode

The memory mirror mode is a function used to duplex memory to ensure the hardware reliability of memory. When memory mirror mode is enabled, the domain can continue operation even if a fault occurs in a part of memory (provided that the fault is recoverable).

Memory mirror mode cannot be set in some division types of PSB. Please see the *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide* for the availability of memory mirroring.

Enabling memory mirror mode does not restrict any DR functions. However, you must consider the domain configuration and operation when enabling memory mirror mode.

For example, when a kernel memory board with memory mirror mode enabled is deleted or moved, kernel memory is moved from the kernel memory board to another system board. Kernel memory is moved normally even if memory mirror mode is disabled for the move-destination system board. However, this operation results in lowered reliability of memory on the new kernel memory board.

You must properly plan and decide the setting of memory mirror mode by fully considering the requirements for the domain configuration and operations.

2.5.5 Capacity on Demand (COD)

DR works the same on COD boards as on other system boards, but standard COD restrictions, such as licensing, still apply.

For detailed information on COD boards, refer to *SPARC Enterprise M4000/M5000/M8000/M9000 Servers Administration Guide*.

2.5.6 XSCF Failover

An XSCF failover might prevent a DR operation from completing. To check, log in to the active XSCF, check the status of the system board and, if necessary, repeat the DR operation.

2.5.7 Kernel Memory Board Deletion

If an XSCF failure or failover occurs during the Copy-rename phase of a `deleteboard(8)` or `moveboard(8)` operation, the Solaris OS may panic and display the following message:

`Irrecoverable FMEM error error_code`

If you see this message, log in to the XSCF again to check status. You may have to reboot the Solaris OS and, on the XSCF, check system board status, specify the kernel memory board, and repeat the DR operation.

2.5.8 Deletion of Board with DVD Drive

To delete the system board to which the server's DVD drive is connected, execute the following steps:

1. **Stop the `vold(1M)` daemon by disabling the `volfs` service.**

```
# /usr/sbin/svcdm disable volfs
```

2. **Execute the DR operation.**

3. **Restart the `vold(1M)` daemon by enabling the `volfs` service.**

```
# /usr/sbin/svcdm enable volfs
```

For details, see the `vold(1M)` Solaris man page.

DR User Interface

This chapter describes the user interfaces for DR.

3.1 How To Use the DR User Interface

XSCF provides two user interfaces for DR: the command line interface by XSCF shell, and the browser-based user interface by XSCF Web. This section describes the main XSCF shell commands used for DR. For other related commands, see [Section 3.2, “Command Reference” on page 3-25](#). For XSCF Web, see [Section 3.2, “Command Reference” on page 3-25](#) and [Section 3.3, “XSCF Web” on page 3-27](#).

XSCF shell commands for DR operations are classified into two types: DR display and DR operation commands.

TABLE 3-1 DR Display Commands

Command name	Function
showdcl	Display the DCL and domain status.
showdomainstatus	Display domain status.
showboards	Display system board information.
showdevices	Display information about the CPUs, memory, and I/O devices on system boards.
showfru	Display PSB configuration information.

TABLE 3-2 DR Operation Commands

Command name	Function
setdcl	Update and edit the DCL.
setupfru	Set the division type and memory mirror mode for a PSB.
addboard	Add a system board to a domain.
deleteboard	Delete a system board from a domain.
moveboard	Move a system board between domains.

The sections below describe the DR display and DR operation commands in detail and show examples. For details of the options, operands, and usage of these commands, refer to *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*.

Note – Use of the user interfaces with XSCF shell and XSCF Web is restricted to selected administrators, and requires administrator privileges for DR operations. When system boards are shared by multiple administrators, the administrators must carefully prepare and plan secure DR operations.

3.1.1 Displaying Domain Information

The `showdcl(8)` command displays domain information including the domain ID, configured system board numbers, and domain status in list format.

The `showdcl(8)` command is used before a DR operation to determine whether the domain status permits DR operation, and confirm the registration of the DR-target system board in the DCL. The `showdcl(8)` command is also used after a DR operation to confirm domain status and configuration.

To change domain settings or register a system board in the DCL, use the `setdcl(8)` command. To change PSB settings, use the `setupfru(8)` command.

The following examples show the format and specifiable options of the `showdcl(8)` command.

```
showdcl [-v] -a
showdcl [-v] -d domain_id [-l lsb ...]
showdcl -h
```


TABLE 3-3 Options of the `showdcl` Command

Option	Description
<code>-a</code>	Displays configuration information and status of all domains.
<code>-v</code>	Displays detailed domain configuration information.
<code>-h</code>	Displays usage information.
<code>-d <i>domain_id</i></code>	Displays information about the specified domain, where <i>domain_id</i> is the domain number, possibly 0 to 23, depending on server model. Only one domain ID can be specified.
<code>-l <i>lsb</i></code>	Displays information about the specified logical system board (LSB), numbered 00 to 15. For information about multiple LSBs, list board numbers separated by a space. For example: <code>showdcl -l 00 -l 01</code>

TABLE 3-4 Items of Domain Information to be Displayed

Display items	Description
DID	Domain ID.
LSB	Logical system board number.
XSB	System board number.
Status	Domain Status
	Powered Off Domain power is off.
	Initialization Phase POST processing or OpenBoot PROM initialization is in progress.
	OpenBoot Executing Completed Initialization of OpenBoot PROM is completed.
	Running Solaris OS is running.
	Shutdown Started Solaris OS is being shut down.
	Panic State Solaris OS panic occurred.
No-mem	Setting of omit-memory option
	true Enabled: Solaris OS does not use memory
	false Disabled: Solaris OS uses memory.
No-IO	Setting of omit-IO option
	true Enabled: Solaris OS does not use I/O device.
	false Disabled: Solaris OS uses I/O device.

TABLE 3-4 Items of Domain Information to be Displayed (*Continued*)

Display items	Description
Float	Setting of floating board option
true	Enabled: Board is designated as a Floating board.
false	Disabled: Board is not designated as Floating board.
Cfg-policy	Setting of configuration policy
FRU	Degradation in units of components.
XSB	Degradation in units of XSB.
System	Stopping of domain without degradation.

The table below lists the items displayed by the `showdcl(8)` command.

The following shows examples of displays by the `showdcl(8)` command.

■ Example 1: Display of information on domain #0

```

XSCF> showdcl -d 0
DID  LSB  XSB  Status
00           Running
      00    00-0
      04    01-0
      05    01-01
      06    01-2
      07    01-3
      08    02-0

```

■ Example 2: Display of detailed information on domain #0

```

XSCF> showdcl -v -d 0
DID  LSB  XSB  Status  No-Mem  No-IO  Float  Cfg-policy
00           Running      False  False  False  FRU
      00    00-0      False  False  False
      01    -
      02    -
      03    -
      04    01-0      False  False  False
      05    01-1      False  True   False
      06    01-2      False  True   True
      07    01-3      True   True   True
      08    02-0      True   True   True
      09    -
      10    -
      11    -

```

3.1.2 Displaying Domain Status

The `showdomainstatus(8)` command lists the domains in the system and their status. This command displays the same domain status information as the `showdcl(8)` command.

Use the `showdomainstatus(8)` command to check domain status before and after a DR operation.

The following examples show the format and options of the `showdomainstatus(8)` command:

```
showdomainstatus -a
showdomainstatus -d domain_id
showdomainstatus -h
```

TABLE 3-5 Options of the `showdomainstatus` Command

Option	Description
-a	Displays the status of all domains.
-d <i>domain_id</i>	Displays information about the specified domain, where <i>domain_id</i> is the domain number, possibly 0 to 23, depending on server model. Only one domain ID can be specified.
-h	Displays usage information.

The table below lists the items displayed by the `showdomainstatus(8)` command.

TABLE 3-6 Items of Domain Information to be Displayed

Display items	Description
DID	Domain ID

TABLE 3-6 Items of Domain Information to be Displayed (*Continued*)

Display items	Description
Status	Domain status
Powered Off	Domain power is off.
Initialization Phase	POST processing or OpenBoot PROM initialization is in progress.
OpenBoot Executing Completed	Initialization by OpenBoot PROM is completed.
Booting/OpenBoot PROM prompt	Solaris OS is being booted or, due to the domain shutdown or reset, the system is in the OpenBoot PROM running state, or is suspended in the OpenBoot PROM (ok prompt) state.
Running	Solaris OS is running.
Shutdown Started	Solaris OS is being shut down.
Panic State	Solaris OS panic occurred.

The following example shows a display of the `showdomainstatus (8)` command.

- Example: Display of information on all domains

```
XSCF> showdomainstatus
DID      Status
00       Running
01       Powered Off
02       -
03       Running
```

3.1.3 Displaying System Board Information

The `showboards(8)` command displays system board information including the domain ID of the domain to which the target system board belongs and various kinds of system board status in list format.

Use the `showboards(8)` command before a DR operation to determine whether the system board status permits DR operations, and to confirm the domain ID of the domain to which the target system board belongs. The `showboards(8)` command is also used after a DR operation to confirm system board status.

To change domain settings or register a system board in the DCL, use the `setdcl(8)` command. To change PSB settings, use the `setupfru(8)` command.

The following examples show the format and options of the `showboards(8)` command.

```
showboards [-v] -a [-c sp]
showboards [-v] -d domain_id [-c sp]
showboards [-v] xsb
showboards -h
```

TABLE 3-7 Options of the `showboards` Command

Option	Description
-v	Displays detailed information about the system board.
-a	Displays information about all mounted system boards.
-h	Displays the usage information.
-d domain_id	Displays information about the specified domain, where <i>domain_id</i> is the domain number, possibly 0 to 23, depending on server model. Only one domain ID can be specified.
xsb	Displays information about the specified XSB. Specify <i>xsb</i> in the XX-Y format. (XX = 00 to 15, Y = 0 to 3). The value depends on server model.
-c sp	Displays information about system boards in system board pool.

The table below lists the items displayed by the `showboards(8)` command.

TABLE 3-8 Items of System Board Information to be Displayed

Display items	Description
XSB	System board number.
R	Reservation status of a system board. “*” is displayed for a system board when the board is reserved for addition, deletion, or a move.
DID (LSB)	Domain ID of the domain into which the system board is added and logical system board number “SP” is displayed for a system board that is in the system board pool.

TABLE 3-8 Items of System Board Information to be Displayed (*Continued*)

Display items	Description	
Assignment	Status of assignment to domain configuration	
	Unavailable	The system board cannot be used. The system board may be unrecognizable because it is not mounted or it is faulty, the domain or system board may not have been configured, or the system board may be assigned to another domain.
	Available	The system board can be used and is registered in the Domain Component List (DCL). The system board is in this status when in the system board pool.
	Assigned	The system board is assigned to the domain.
Pwr	Power-on/off status of system board	
	n	Power-off status. The system board is powered off and cannot be used.
	y	Power-on status. The system board is powered on.
Conn	Status of connection to domain configuration	
	n	Disconnected status. The system board is disconnected from the relevant domain configuration or in the system board pool.
	y	Connected status. The system board is connected to the relevant domain configuration.
Conf	Status of addition into Solaris OS	
	n	Unconfigured status. The hardware resources of the system board have been deleted from the Solaris OS.
	y	Configured status. The hardware resources of the system board have been added into the Solaris OS.

TABLE 3-8 Items of System Board Information to be Displayed (*Continued*)

Display items	Description
Test	Diagnostic status of system board
Unmount	The system board is not mounted or cannot be recognized because it is faulty.
Unknown	The system board is not being diagnosed.
Testing	testing.
Passed	The system board was tested, and passed.
Failed	A system board error was tested, and failed. The system board cannot be used or has been degraded.
Fault	Normal/abnormal status of system board
Normal	Normal.
Degraded	Components have been degraded, but the system board is operating. Degraded here means that a system board included in the corresponding component is faulty.
Failed	The system board cannot operate because of an error.
COD	Indication of whether the system board is a COD board.
n	The board is not a COD board.
y	The board is a COD board.

The following examples show displays of the `showboards(8)` command

■ **Example 1:** Display of information on all system boards

XSCF> showboards -a							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-0	00(00)	Assigned	y	y	y	Passed	Normal
00-1	00(01)	Assigned	y	n	n	Passed	Degraded
00-2	SP	Available	y	n	n	Unknown	Normal
00-3	01(15)	Assigned	y	y	y	Passed	Normal

- **Example 2:** Display of detailed information on all system boards

XSCF> showboards -v -a									
XSB	R	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault	COD

00-0		00(00)	Assigned	y	y	y	Passed	Normal	n
00-1		00(01)	Assigned	y	n	n	Passed	Degraded	n
00-2	*	SP	Available	y	n	n	Unknown	Normal	n
00-3		01(15)	Assigned	y	y	y	Passed	Normal	n

- **Example 3:** Display of information on the system board in the system board pool in domain #0

XSCF> showboards -c sp -d 0							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-2	SP	Available	y	n	n	Passed	Normal

3.1.4 Displaying Device Information

Use the `showdevices(8)` command to display device information.

The `showdevices(8)` command displays information about the physical devices including CPUs, memory, and PCI cards mounted on system boards, and displays the hardware resources usable with these devices in hardware resource format.

The `showdevices(8)` command is used before a DR operation to confirm information about and status of the hardware resources of the DR-target system board, and to determine the process to access the CPU and I/O devices.

Resource management applications or subsystems provide information concerning use of the hardware resources. A `showdevices(8)` command offline query about management target resources estimates the effect of each DR operation applied to the system boards and displays the results.

The following examples show the format and options of the `showdevices(8)` command.

showdevices	[-v]	[-p bydevice byboard query force]	xsb	[...]
showdevices	[-v]	[-p bydevice byboard]	-d domain_id	
showdevices	-h			

Note – The `showdevices(8)` command only reports information about a running domain.

TABLE 3-9 Options of the `showdevices` Command

Option	Description
<code>-v</code>	Specifies that the command displays information about all devices. Information about not only the management target devices but also other devices is displayed. However, the displayed information includes resource information about the devices whose resources are managed and does not include resource information about the devices whose resources are not managed.
<code>-p bydevice</code>	Specifies that the command display information about the devices mounted on a system board (CPU, memory, and I/O devices), sorted by device. If neither <code>-p bydevice</code> nor <code>-p byboard</code> is specified, <code>-p bydevice</code> is the default.
<code>-p byboard</code>	Specifies that the command display information about the devices mounted on system boards (CPU, memory, and I/O devices) by system board.
<code>-p query</code>	Tests the detachability of the board by test-running the DR command without actually executing it.
<code>-p force</code>	Tests the detachability of the board by test-running the DR command with the force flag without actually executing it.
<code>xsb</code>	Specifies a system board (XSB) number. Specify <i>xsb</i> in the <i>XX-Y</i> format. (<i>XX</i> = 00 to 15, <i>Y</i> = 0 to 3). The value depends on server model.
<code>-d domain_id</code>	Specifies ID of the specified domain, where <i>domain_id</i> is the domain number, possibly 0 to 23, depending on server model. Only one domain ID can be specified.

TABLE 3-10 Domain Information Displayed by the `showdevices` command

Display items	Description
CPU	CPU information.
	DID Domain ID.
	XSB System board number.
	id CPU ID.
	state CPU status.
	speed CPU frequency (MHz).
	ecache CPU cache size (Megabyte: MB).
	usage Description of instance using resources.
Memory	Memory information.
	DID Domain ID
	XSB System board number
	board mem Size of memory on system board (MB).
	perm mem Size of non-relocatable (kernel) memory on system board (MB)
	base address Base physical address of memory on system board.
	domain mem Size of memory in domain (MB).
	target board System board number of the system board whose kernel memory is drained.
	deleted mem Size of already deleted memory (MB).
	remaining mem Size of remaining memory to be deleted (MB).
IO Devices	I/O device information.
	DID Domain ID.
	XSB System board number.
	device Instance name and number of I/O device.
	resource Management resource name.
	usage Description of resource usage.
	query Results of estimation with an offline query.
	usage/reason Description of resource usage and reason for the results of estimation with an offline query.

The following example shows a display by the `showdevices(8)` command.

■ **Example:** Display of device information on XSB00-0

```
XSCF> showdevices 00-0
CPU:
----
DID   XSB   id   state   speed  ecache
00    00-0  0    on-line 2048    4
00    00-0  1    on-line 2048    4

Memory:
-----
          board perm      base                domain target deleted
remaining
DID   XSB   mem MB mem MB   address                mem MB  XSB      mem MB
mem MB
00    00-0  8192   2048   0x000003c000000000    65536

I/O Devices:
-----
DID   XSB   device   resource                usage
00    00-0  sd0       /dev/dsk/c0t0d0s0      mounted filesystem "/"
00    00-0  sd0       /dev/dsk/c0t0d0s1      swap area
00    00-0  sd0       /dev/dsk/c0t0d0s1      dump device (swap)
00    00-0  bge0      SUNW_network/bge0      bge0 hosts IP addresses:
10.1.1.1
```

3.1.5 Displaying System Board Configuration Information

Use the `showfru(8)` command to display system board configuration information. The `showfru(8)` command displays information about the PSB division type and memory mirroring mode settings in list format.

To change the PSB configuration, use the `setupfru(8)` command.

The following examples show the format and options of the `showfru(8)` command.

```
showfru -a device
showfru device location
showfru -h
```

TABLE 3-11 Options of the `showfru` Command

Option	Description
<code>-a</code>	Specifies that the command display all configuration information on devices of the type specified by <code>devtype</code> .
<code>-h</code>	Displays usage information.
<i>device</i>	Specifies a device type. Specify “sb” for DR.
<i>location</i>	Specifies a device name. Specifies a physical system board (PSB) number. Specify a decimal number from 00 to 15 for PSB. To display information about multiple system boards, several PSB numbers can be specified by delimiting each with a space. The range of PSB numbers to be specified varies depending on the model used.

The table below lists the items displayed by the `showfru(8)` command.

TABLE 3-12 Items of System Board Configuration Information to be Displayed

Display items	Description
Device	Device type. “sb” is the corresponding device for DR.
Location	Mounting location of a device. Displays a physical system board (PSB) number.
XSB Mode	XSB division type. Uni Uni-XSB (no division) mode. Quad Quad-XSB: four-division mode.
Memory Mirror Mode	Memory mirror mode. yes Memory mirror mode is enabled. no Memory mirror mode is disabled.

The following example shows a display of the `showfru(8)` command.

- **Example:** Display of configuration information on all system boards

XSCF> showfru -a sb			
Device	Location	XSB Mode	Memory Mirror Mode
sb	00	Quad	yes
sb	01	Quad	yes
sb	02	Quad	no
sb	03	Uni	no

3.1.6 Adding a System Board

Use the `addboard(8)` command to add a system board to a domain or reserve the addition of a system board to a domain based on the DCL. The system board must already be registered in the target domain's DCL.

Use the `showdcl(8)` command to check whether a system board is registered in the DCL. To register a system board in the DCL, use the `setdcl(8)` command.

Before executing the `addboard(8)` command, check the status of the DR-target domain and system board. You must determine whether you can perform the DR operation based on the status of the domain and system board.

The following examples show the format and options of the `addboard(8)` command.

```
addboard [[-q] [-y|n]] [-f] [-v] [-c configure] -d domain_id xsb [...]
addboard [[-q] [-y|n]] [-f] [-v] -c assign -d domain_id xsb [...]
addboard [[-q] [-y|n]] [-f] [-v] -c reserve -d domain_id xsb [...]
addboard -h
```

TABLE 3-13 Options of the `addboard` Command

Option	Description
-q	Specifies the suppression of output message display. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-y	Specifies that a response of "yes" is made automatically to all output messages. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-n	Specifies that a response of "no" is made automatically to all output messages. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-f	Forcibly adds a system board that has not been diagnosed to a domain. This option for normal DR operations must not be used. A faulty system board, or a system board where a fault is detected will not be forcibly added to the destination domain.
-v	Displays the progress of this DR command. If the option is specified with the -q option, the -v option is ignored.

TABLE 3-13 Options of the addboard Command (*Continued*)

Option	Description
-h	Displays the usage information.
-c configure	Specifies that the command add a system board to the domain. If no other -c option is specified, -c configure is the default.
-c assign	Specifies that the command assign a system board to the domain. With this option specified, the command assigns the target system board to the domain. The assigned system board is added to the domain when the addboard(8) command with the -c configure option specified is executed, and then the domain power is turned on or the domain rebooted.
-c reserve	Specifies that the command reserve the addition of a system board to the domain. With this option specified, the command executes the same processing as for the -c assign option, and it assigns the target system board to the domain. The assigned system board is added to the domain when the addboard(8) command with the -c configure option specified is executed, and then the domain power is turned on or the domain is rebooted.
-d domain_id	Specifies the domain ID of the domain to add a system board, where domain_id is the domain number, possibly 0 to 23, depending on server model. Only one domain ID can be specified.
xsb	Specifies the system board (XSB) number of the system board to be added. Specify xsb in the XX-Y format. (XX = 00 to 15, Y = 0 to 3). The value depends on server model. To specify multiple system boards, several XSB numbers can be specified by delimiting each with a space.

Note – (Note 1) In the system board addition processing executed by this command, a diagnosis of the system board to be added is performed first, and then the system board is added to the target domain. For this reason, much time may be required for the command to complete its operation.

Note – (Note 2) If DR processing by the addboard(8) command fails, the target system board cannot be restored to its previous status. You must identify the cause of failure based on the error message output by the addboard(8) command and Solaris OS messages, and then take appropriate corrective action. Note that some errors require the domain to be rebooted.

Note – (Note 3) If a system board has been forcibly added to a domain by the `addboard(8)` command with the `-f` option specified, normal operation of all added hardware resources may be disabled. For this reason, you should avoid using the `-f` option for normal DR operations. After adding a system board by using the `addboard(8)` command with the `-f` option specified, be sure to check the status of the added system board and the devices on the system board.

3.1.7 Deleting a System Board

Use the `deleteboard(8)` command to delete a system board from a domain and assign it to the system board pool. If you specify the `-c reserve` option, the action takes place the next time the domain is powered off or rebooted.

Before executing the `deleteboard(8)` command, check the status of the target domain and system board, and the device usage status on the system board. You must determine whether you can perform the DR operation according to the status of the domains and system board, and the device usage status on the system board. You must also stop the processes that are bound to the CPU and the accessing of I/O devices to prepare for system board deletion.

If the system board to be deleted is a kernel memory board, check the status and memory size of the system board to which kernel memory is to be moved.

The following examples show the format and options of the `deleteboard(8)` command.

```
deleteboard [[-q] -{y|n}] [-f] [-v] [-c disconnect] xsb [xsb...]
deleteboard [[-q] -{y|n}] [-f] [-v] -c unassign xsb [xsb...]
deleteboard [[-q] -{y|n}] [-f] [-v] -c reserve xsb [xsb...]
deleteboard -h
```

TABLE 3-14 Options of the deleteboard Command

Option	Description
-q	Specifies the suppression of output message display. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-y	Specifies that a response of "yes" is made automatically to output messages. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-n	Specifies that a response of "no" is made automatically to output messages. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-f	Forcibly deletes a system board from the domain. This option for normal DR operations must not be used.
-v	Displays the progress of this DR command. If the option is specified with the -q option, the -v option is ignored.
-h	Displays the usage information.
-c disconnect	Specifies that the command delete a system board from the domain and set it in the status where it is assigned to the domain. This is a default option.
-c unassign	Deletes the board and adds it to the system board pool. The command unconfigures and disconnects the system board from the domain. If the board is in the state where it is assigned to the domain, the command unassigns the board from the domain and puts it in the system board pool. Also, if the domain power is off, the command similarly puts the board in the system board pool.
-c reserve	Reserves the deletion of a system board from a domain. The system board is deleted from the domain and placed in the system board pool when the domain power is turned off or the domain is rebooted. If the board is in the state where it is assigned to the domain, the command unassigns the board from the domain and places it in the system board pool. Also, if the domain power is off, the command similarly places the board in the system board pool.
<i>xsb</i>	Specifies the system board (XSB) number of the system board to be deleted. Specify <i>xsb</i> in the XX-Y format. (XX = 00 to 15, Y = 0 to 3). The value depends on server model. To specify multiple system boards, several XSB numbers can be specified by delimiting each with a space.

Note – (Note 1) The time required for system board deletion processing depends on the amount of hardware resources mounted on the target system board. For this reason, much time may be required for the command to end its operation. If the system board contains kernel memory, the OS is suspended for a while.

Note – (Note 2) If the DR processing executed by the `deleteboard(8)` command fails, the target system board cannot be restored to the previous status. If DR processing fails, identify the cause of failure based on the error message output by the `deleteboard(8)` command and Solaris OS messages, and then take appropriate corrective action. Note that some errors require the domain to be rebooted.

Note – (Note 3) When a system board is forcibly deleted from a domain by the `deleteboard(8)` command with the `-f` option specified, a serious problem may occur in a process that is bound to the CPU or in accessing an I/O device. For this reason, you should avoid using the `-f` option for normal DR operations. When using the `deleteboard(8)` command with the `-f` option specified, be sure to check the status of the domain and application processes.

3.1.8 Moving a System Board

Use the `moveboard(8)` command to delete a system board from the move-source domain and add it to the move-destination domain, assign it to the move-destination domain, or reserve it to be moved later.

To execute the `moveboard(8)` command, the system board must have been configured in or assigned to the move-source domain, and be registered in the DCL for the move-destination domain.

Use the `showdcl(8)` command to check whether a system board is registered in the DCL. To register a system board in the DCL, use the `setdcl(8)` command.

Before executing the `moveboard(8)` command, check the status of the move-source and move-destination domains and move-target system board, and the device usage status on the system board. You must determine whether you can perform the DR operation according to the status of the domains and system board, and the device usage status on the system board. You must also stop any processes that are bound to the CPU and any that are accessing I/O devices to prepare for system board deletion.

If the system board to be deleted is a kernel memory board, check the status and memory size of the system board to which kernel memory is to be moved.

The following examples show the format and options of the `moveboard(8)` command.

```
moveboard [[-q] [-y|n]][-f][-v][-c configure] -d domain_id xsb[xsb...]
moveboard [[-q] [-y|n]][-f][-v] -c assign -d domain_id xsb[xsb...]
moveboard [[-q] [-y|n]][-f][-v] -c reserve -d domain_id xsb[xsb...]
moveboard -h
```

TABLE 3-15 Options of the `moveboard` Command

Option	Description
-q	Specifies the suppression of output message display. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-y	Specifies that a response of "yes" is made automatically to output messages. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-n	Specifies that a response of "no" is made automatically to output messages. The -y or -n option determines how output messages are automatically answered, whether or not the messages themselves are suppressed (with the -q option) or displayed.
-f	Forcibly deletes a system board from the move-source domain and move it to the move-destination domain. This option for normal DR operations must not be used. A faulty system board, or a system board where a fault is detected will not be forcibly added to the destination domain.
-v	Displays messages about the progress of this DR operation. If the option is specified with the -q option, the -v option is ignored.
-h	Displays the usage information.
-c configure	Specifies that the command delete a system board from the move-source domain and adds it to the move-destination domain. If no other -c option is specified, -c configure is the default. The move operation from the move-source domain is performed when the domain power is off or the Solaris OS is running in the move-source domain. However, if the domain power is off or the Solaris OS is not running in the move-destination domain, the move operation from the move-source domain is not performed and DR processing terminates with an error.

TABLE 3-15 Options of the `moveboard` Command (*Continued*)

Option	Description
<code>-c assign</code>	<p>Specifies that the command delete a system board from the move-source domain and assign it to the move-destination domain.</p> <p>The assigned system board is added to the move-destination domain when the <code>addboard(8)</code> command is executed in the move-destination domain, the power of the move-destination domain is turned on, or the move-destination domain is rebooted.</p> <p>The move operation from the move-source domain is performed and the system board is set to the state where it is assigned to the move-destination domain when the domain power is off in both the move-source domain and the move-destination domain or the Solaris OS is not running in both domains.</p>
<code>-c reserve</code>	<p>Specifies that the command reserve a system board move in the move-source domain.</p> <p>The system board is deleted from the move-source domain and assigned to the move-destination domain when the power of move-source domain is turned off or the move-source domain rebooted.</p> <p>The assigned system board is added to the move-destination domain when the <code>addboard(8)</code> command is executed in the move-destination domain, the power of the move-destination domain is turned on, or the move-destination domain is rebooted.</p> <p>The move operation from the move-source domain is performed and the system board is set to the state where it is assigned to the move-destination domain when the domain power is off or the Solaris OS is not running in the move-source domain.</p>
<code>-d domain_id</code>	<p>Specifies the domain ID of the move-destination domain, where <i>domain_id</i> is the domain number, possibly 0 to 23, depending on server model. Only one domain ID can be specified.</p>
<i>xsb</i>	<p>Specifies the system board (XSB) number of the system board to be moved.</p> <p>Specify <i>xsb</i> in the XX-Y format. (XX = 00 to 15, Y = 0 to 3). The value depends on server model. To specify multiple system boards, several XSB numbers can be specified by delimiting each with a space.</p>

Note – (Note 1) The time required for system board deletion processing in the move-source domain depends on the amount of hardware resources mounted on the target system board. Moreover, in the system board addition processing in the move-destination domain, the system board to be added is first diagnosed, and then added to the domain. For this reason, much time may be required for the command to end its operation. Solaris OS is suspended for a while when the system board includes kernel memory.

Note – (Note 2) If the DR processing executed by the `moveboard(8)` command fails, the target system board cannot be restored to the previous status. If DR processing fails, identify the cause of failure based on the error message output by the `moveboard(8)` command and Solaris OS messages in the move-source and move-destination domains, and then take appropriate corrective action. Note that some errors require one of the domains to be rebooted.

Note – (Note 3) When a system board is forcibly deleted from the move-source domain by the `moveboard(8)` command with the `-f` option specified, a serious problem may occur in a process that is bound to the CPU or in accessing an I/O device. For this reason, you should avoid using the `-f` option for normal DR operations. When using the `moveboard(8)` command with the `-f` option specified, be sure to check the status of the move-source domain and application processes.

3.1.9 Replacing a System Board

Use the `deleteboard(8)` and `addboard(8)` commands to replace a system board. Use them to replace, add, or delete such hardware resources as the CPU, memory, and I/O devices, or replace the PSB of a CMU or IOU.

Note – In a midrange server, you cannot use DR commands to replace a system board. Instead, turn off the power of all domains, and then replace the target system board.

To replace a system board in a domain, first delete the target system board from the domain by using the `deleteboard(8)` command to make the PSB replaceable. Next, replace the PSB with a new one, and then add the target system board to the domain.

For details of the conditions and actions for executing the `deleteboard(8)` command, see [Section 3.1.7, “Deleting a System Board” on page 3-17](#). For details of the conditions and actions for executing the `addboard(8)` command, see [Section 3.1.6, “Adding a System Board” on page 3-15](#).

Note – (Note 1) Before replacing a system board, you must know the division type of the replacement-target PSB and the configurations and operation status of all domains to which all XSBs on the PSB belong.

If the division type of the replacement-target PSB is Quad-XSB and the XSBs on the replacement-target PSB belong to multiple domains, you must consult with all administrators of the relevant domains in advance to adequately adjust the method of replacing the system board.

If the division type of the replacement-target PSB is Uni-XSB, its replacement does not affect any other domains. However, prior adjustment may be required when the replacement-target system board is used as a floating board for multiple domains or hardware replacement work may affect other domains

Note – (Note 2) If the DR processing executed by the `deleteboard(8)` or `addboard(8)` commands fails, the target system board cannot be restored its the previous status. Identify the cause of failure based on the error messages output by the commands and Solaris OS messages, and then take appropriate corrective action. Note that some errors require the domain to be rebooted.

Note – (Note 3) If a system board is forcibly deleted from a domain by the `deleteboard(8)` command with the `-f` option specified, a serious problem may occur in a process bound to the CPU or accessing an I/O device. For this reason, you should avoid using the `-f` option in normal DR operations. If you must use the `deleteboard(8)` command with the `-f` option specified, be sure to check the status of the domain and application processes before and after execution.

Note – (Note 4) To execute the `addboard(8)` command to add a system board by DR, the system board must already be registered in DCL. Use the `showdcl(8)` command to check whether a system board is registered in the DCL. To register a system board in the DCL, use the `setdcl(8)` command.

To replace hardware, you must set the system board to the state where it is assigned to the domain or to the state where it is placed in the system board pool by using the `deleteboard(8)` command.

3.1.10 Reserving a Domain Configuration Change

Use the `addboard(8)`, `deleteboard(8)`, or `moveboard(8)` command to reserve a domain configuration change.

A domain configuration change is reserved when a system board cannot be added, deleted, or moved immediately for operational reasons. The reserved addition, deletion, or move of the system board is executed when the power of the target domain is turned on or off, or the domain rebooted.

If a system board is placed in the system board pool, a domain configuration change can be reserved to assign the system board to the intended domain in advance, preventing the system board from being acquired by another domain.

To reserve the addition of a system board to a domain, use the `addboard(8)` command with the `-c reserve` option specified. The system board will be added to the domain when the domain power is turned on, the domain is rebooted, or the next time the `addboard(8)` command with the `-c configure` option specified is executed.

For details about the `addboard(8)` command, see [Section 3.1.6, “Adding a System Board”](#) on page 3-15.

To reserve the deletion of a system board from a domain, use the `deleteboard(8)` command with the `-c reserve` option specified. The system board will be deleted from the domain when the domain power is turned off, the domain is rebooted, or the next time the `deleteboard(8)` command with the `-c disconnect` or `-c unassign` option specified is executed. For details about the `deleteboard(8)` command, see [Section 3.1.7, “Deleting a System Board”](#) on page 3-17.

To reserve a system board move in a domain to another domain, use the `moveboard(8)` command with the `-c reserve` option specified. The system board will be deleted from the move-source domain and moved to the move-destination domain when the power of the move-source domain is turned off, the move-destination domain is rebooted, or the next time the `moveboard(8)` command with the `-c configure` or `-c assign` option specified is executed.

For details about the `moveboard(8)` command, see [Section 3.1.8, “Moving a System Board”](#) on page 3-19.

3.2 Command Reference

This section lists the DR commands and other commands related to DR.

For details of the commands, refer to *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*. For the DR commands, see [Section 3.1, “How To Use the DR User Interface” on page 3-1](#).

Note – (Note 1) Use of each command is restricted to selected administrators only. To use each command, you must have appropriate administrator privileges. For details, refer to *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*.

Note – (Note 2) This section does not list all commands related to DR. For other DR-related commands, refer to *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*.

TABLE 3-16 DR Display Commands

Command name	Function
showdcl	Displays the DCL and the domain status.
showdomainstatus	Displays domain status.
showboards	Displays system board information.
showdevices	Displays information about the CPUs, memory, and I/O devices on system boards.
showfru	Displays PSB configuration information.

TABLE 3-17 DR Operation Commands

Command name	Function
setdcl	Updates and edits the DCL.
setupfru	Sets the division type and memory mirror mode for PSB.
addboard	Adds a system board into a domain.
deleteboard	Deletes a system board from a domain.
moveboard	Moves a system board between domains.

TABLE 3-18 DR-related Commands

Command name	Function
poweron	Turns on the power of all domains or a specified domain.
poweroff	Turns off the power of all domains or a specified domain.
setdscp	Configures DSCP network.
showdscp	Displays the DSCP network configuration.
addfru	Installs a Field Replaceable Unit (FRU).
deletefru	Removes a Field Replaceable Unit (FRU).
replacefru	Replaces a Field Replaceable Unit (FRU).
addcodlicense	Applies the license key obtained from the license center to the system.
deletecodlicense	Deletes the license key applied to the system.
showcodlicense	Displays the license keys applied to the system.
showcodusage	Displays license usage information.
setcod	Configures COD settings.
showcod	Displays COD settings.
showhardconf	Displays all components mounted in the server.
showstatus	Lists degraded components.
showlog	Displays an error log, power log, event log, console log, panic log, IPL log, temperature/humidity log, and monitoring message log.

3.3 XSCF Web

XSCF Web lets you execute DR functions from a browser. XSCF Web is beyond the scope of this document. For details, refer to *SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

3.4 RCM Script

Reconfiguration Coordination Manager (RCM) is a framework used to manage the dynamic disconnection of system components. RCM provides script functions that enable you to write your own scripts for dynamic reconfiguration. Using RCM scripts enables you to avoid complicated DR operations (e.g., stopping applications and releasing devices from applications).

For details of how to register RCM scripts and script execution timing, see the Solaris man page for `rcmscript(4)`.

Note – (Note 1) An RCM script can only automate actions performed to prepare for the deletion of a system board. When a system board is added to a domain, any actions required for use of the added resources must be manually performed.

Note – (Note 2) You should test the RCM scripts you create for DR before executing the DR operations. The RCM scripts may not be able to execute certain processing.

Practical Examples of DR

This chapter provides examples of DR operations, such as the addition, deletion, move, and replacement of system boards.

Each example shows an operation procedure using the command line interface of the XSCF shell. Similar procedures can also be applied to DR operations using the browser-based interface of the XSCF Web.

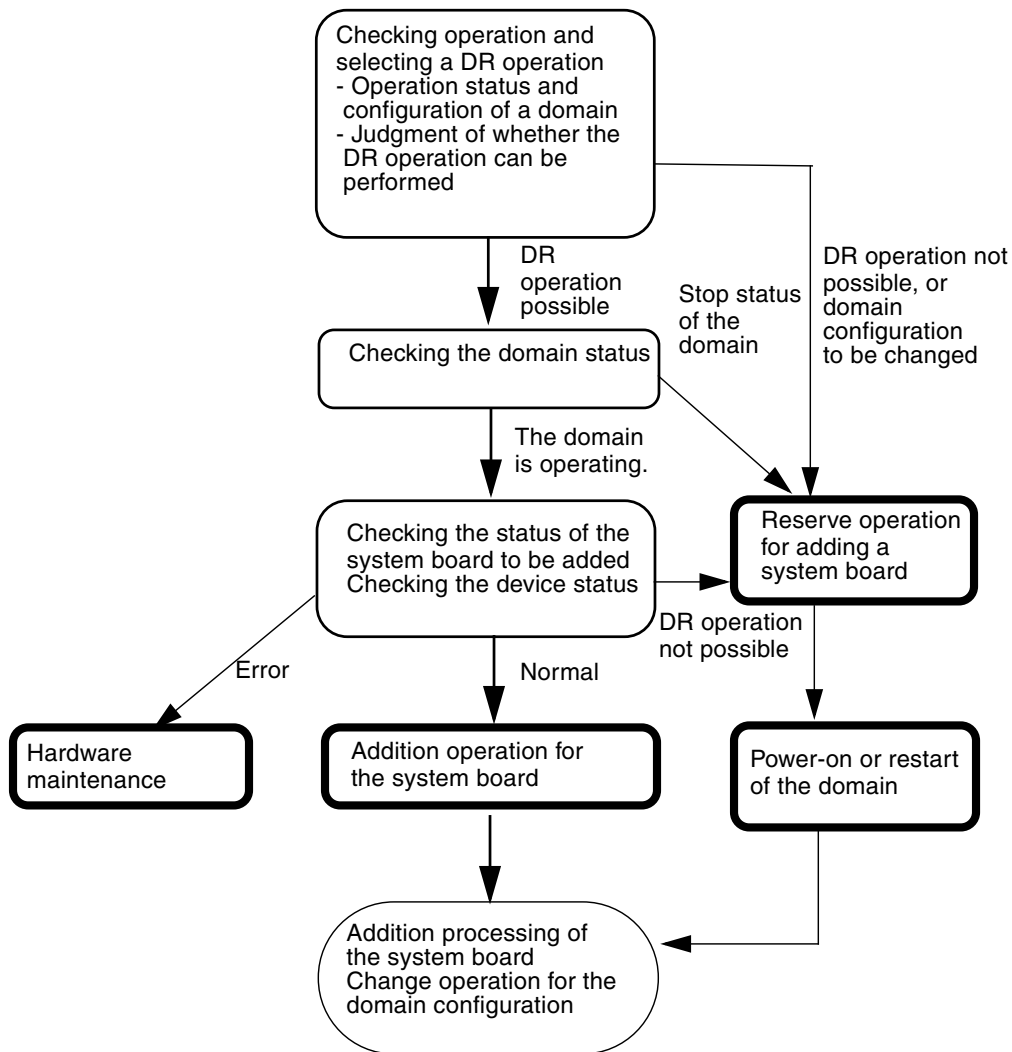
Note that the sections below explain only procedures such as those for checking the status of components and devices for DR operations and not hardware operations (e.g., installing, removing, and replacing system boards). Refer to the service manual for each server as needed.

4.1 Flow of DR Operation

This section provides the flows of basic DR operations to add, delete, move, and replace system boards, along with flow diagrams.

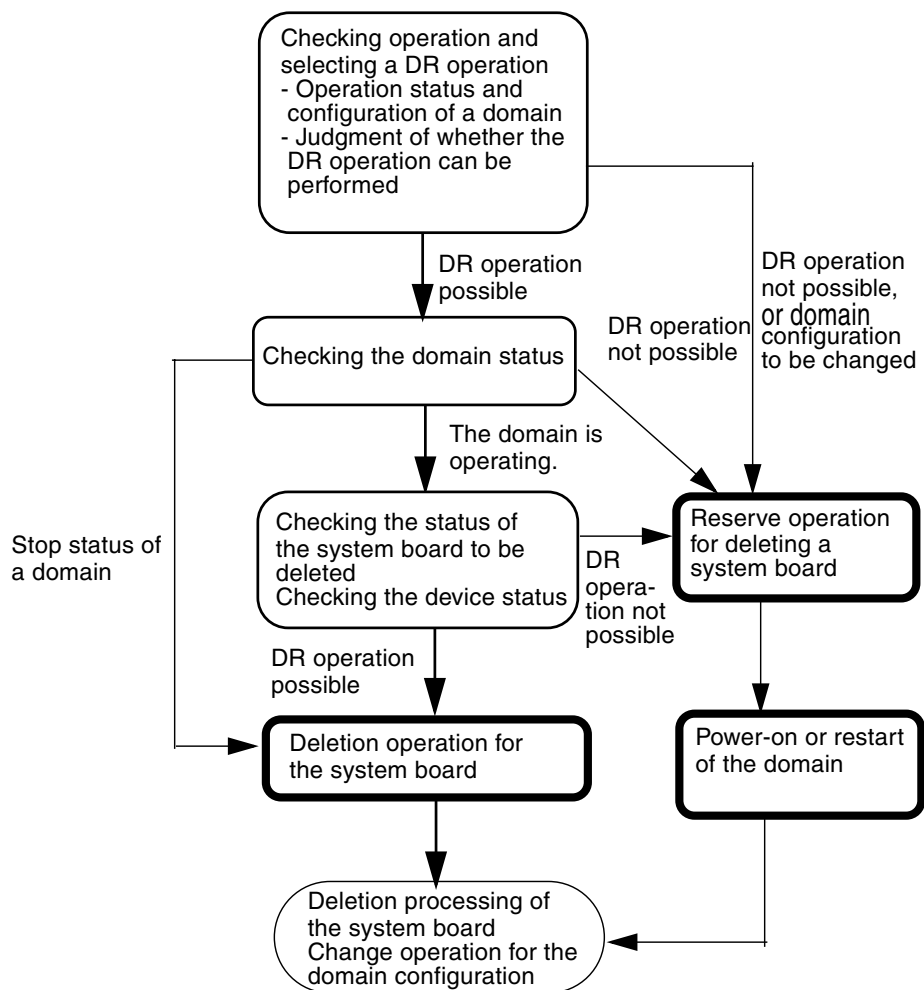
4.1.1 Flow: Adding a System Board

FIGURE 4-1 Flow: Adding a System Board



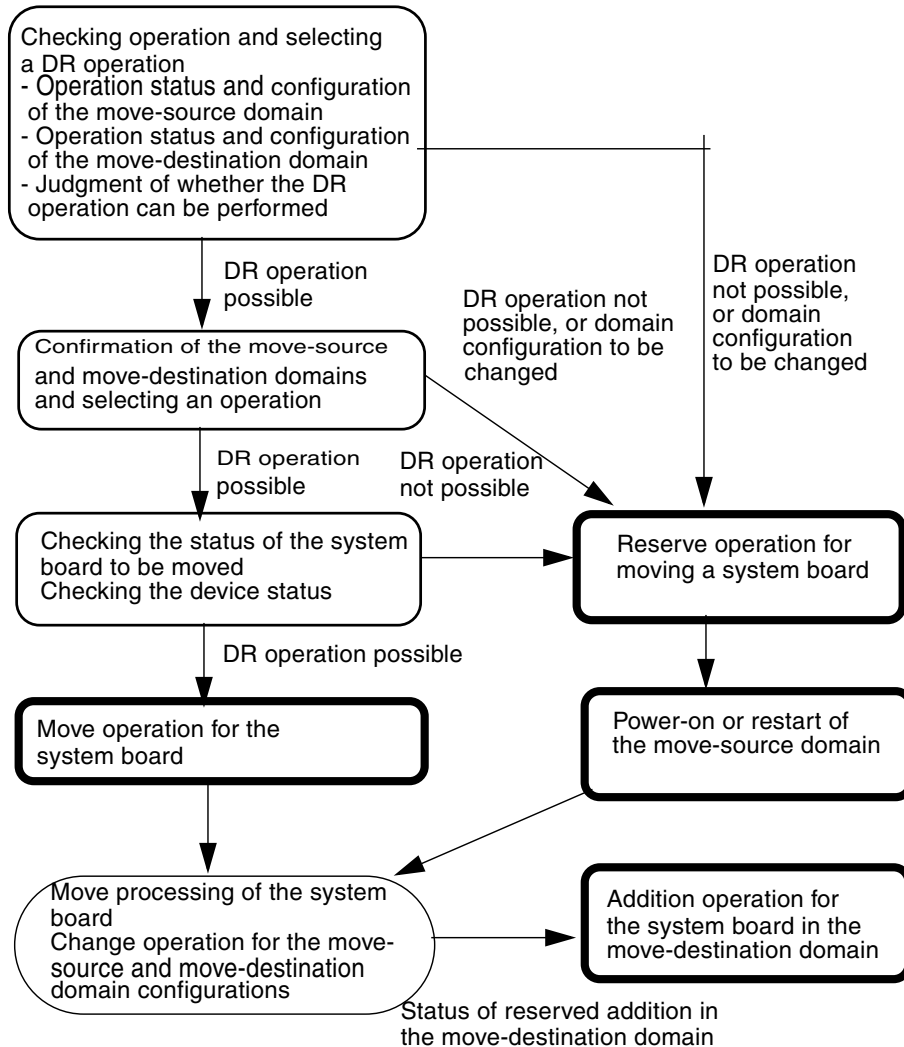
4.1.2 Flow: Deleting a System Board

FIGURE 4-2 Flow: Deleting a System Board



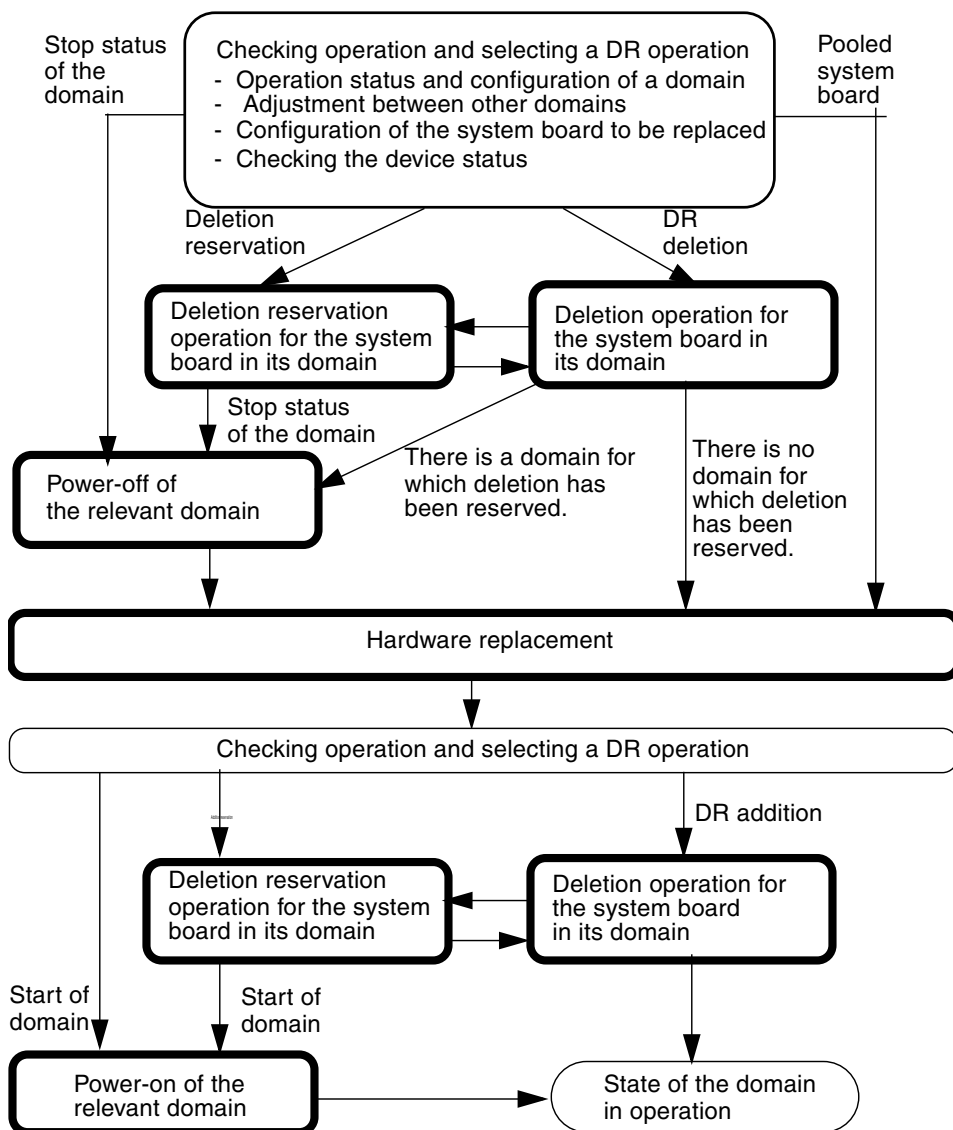
4.1.3 Flow: Moving a System Board

FIGURE 4-3 Flow: Moving a System Board



4.1.4 Flow: Replacing a System Board

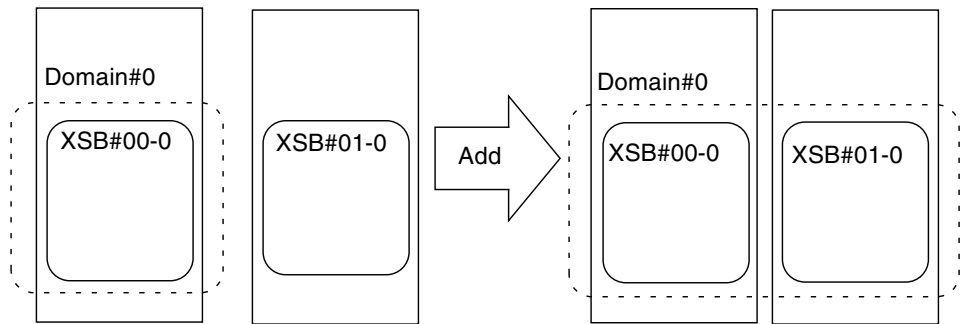
FIGURE 4-4 Flow: Replacing a System Board



4.2 Example: Adding a System Board

This section provides an example of the DR operation to add a system board to a domain. In the example, a procedure conforming to section <LinkColor>4.1.1, "Flow: Adding a System Board.", is used, and the system board shown in the figure is added by using the XSCF shell.

FIGURE 4-5 Example: Adding a System Board



- 1. Login to XSCF.
- 2. Check the status of the domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the domain. Based on the operation status of the domain, determine whether to perform the DR operation or change the domain configuration.

XSCF> showdcl -d 0			
DID	LSB	XSB	Status
00			Running
	00	00-0	
	01	01-0	

- 3. Check the status of the system board to be added.
- Execute the `showboards(8)` command to display system board information, and then check the status of the system board to be added and confirm its registration in the DCL.

If you need to change the PSB configuration, use the `setupfru(8)` command. If the system board to be added is not registered in the DCL, register the system board in the DCL of the target domain by using the `setdcl(8)` command.

XSCF> showboards -a							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-0	00(00)	Assigned	y	y	y	Passed	Normal
01-0	SP	Available	y	n	n	Passed	Normal

4. Add the new system board.

Execute the `addboard(8)` command to add the system board to the move-destination domain.

XSCF> addboard -c configure -d 0 01-0							
--	--	--	--	--	--	--	--

5. Check the status of the domain and added system board.

When the `addboard(8)` command ends normally, execute the `showdcl(8)` command to check the operation status of the domain, and then execute the `showboards(8)` command to check the status of the added system board.

If the `addboard(8)` command completes abnormally or leaves the board in an unwanted status, refer output messages to identify the problem, then correct it.

XSCF> showdcl -d 0			
DID	LSB	XSB	Status
00			Running
	00	00-0	
	01	01-0	

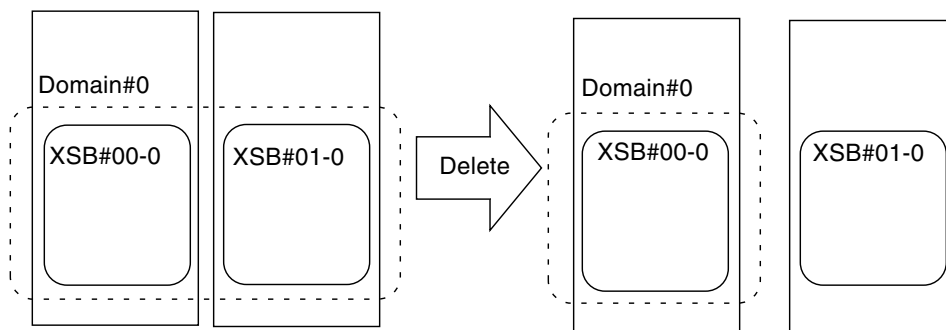
XSCF> showboards -d 0							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-0	00(00)	Assigned	y	y	y	Passed	Normal
01-0	00(01)	Assigned	y	y	y	Passed	Normal

4.3 Example: Deleting a System Board

This section provides an example of operation to delete a system board from a domain. In the example, a procedure conforming to [Section 4.1.2, “Flow: Deleting a System Board” on page 4-3](#), is used, and the system board shown in the figure is deleted using the XSCF shell.

FIGURE 4-6 Example: Deleting a System Board



1. Login to XSCF.
2. Check the status of the domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the domain. Based on the operation status of the domain, determine whether to perform the DR operation or change the domain configuration.

```
XSCF> showdcl -d 0
DID  LSB  XSB    Status
00           Running
      00   00-0
      01   01-0
```

3. Check the status of the system board to be deleted.

Execute the `showboards(8)` command to display system board information, and then check the status of the system board to be deleted.

XSCF> showboards -a							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-0	00(00)	Assigned	y	y	y	Passed	Normal
01-0	00(01)	Assigned	y	y	y	Passed	Normal

4. Delete the system board.

Execute the `deleteboard(8)` command to delete the system board and pool it in the system board pool.

```
XSCF> deleteboard -c unassign 01-0
```

5. Check the status of the domain and deleted system board.

When the `deleteboard(8)` command ends normally, execute the `showdcl(8)` command to check the operation status of the domain, and then execute the `showboards(8)` command to check the status of the deleted system board.

If the `deleteboard(8)` command completes abnormally or leaves the board in an unwanted status, refer output messages to identify the problem, then correct it.

XSCF> showdcl -d 0			
DID	LSB	XSB	Status
00			Running
	00	00-0	
	01	01-0	

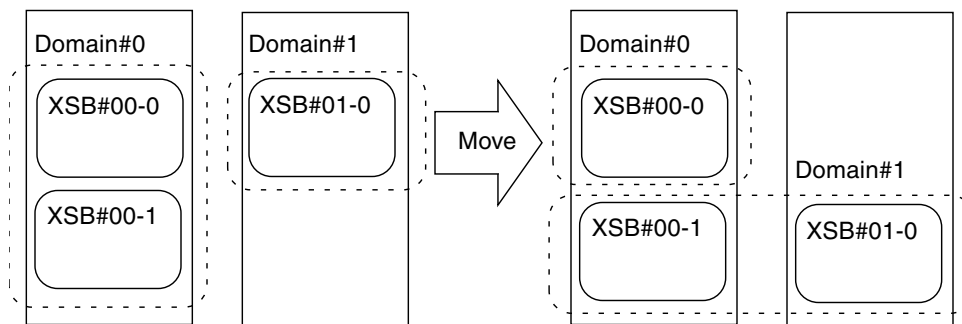
XSCF> showboards -a							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-0	00(00)	Assigned	y	y	y	Passed	Normal
01-0	SP	Available	y	n	n	Passed	Normal

4.4 Example: Moving a System Board

This section provides an example of an operation to move a system board between domains. In the example, a procedure conforming to [Section 4.1.3, “Flow: Moving a System Board”](#) on page 4-4, is used, and the system board shown in the figure is moved using the XSCF shell.

FIGURE 4-7 Example: Moving a System Board



1. Login to XSCF.

2. Check the status of the move-source domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the move-source domain.

```
XSCF> showdcl -d 0
DID  LSB  XSB  Status
00
    00  00-0
    01  00-1
```

3. Check the status of the move-destination domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the move-destination domain. Based on the operation status of the move-source and move-destination domains, determine whether to perform the DR operation or change the domain configuration.

XSCF> showdcl -d 1			
DID	LSB	XSB	Status
01			Running
	00	01-0	
	01	00-1	

4. Check the status of the system board to be moved.

Execute the `showboards(8)` command to display system board information, and then check the status of the system board to be moved.

XSCF> showboards 00-1							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault
-----	-----	-----	-----	-----	-----	-----	-----
00-1	00(01)	Assigned	y	y	y	Passed	Normal

5. Move the system board.

Execute the `moveboard(8)` command to delete the system board from the move-source domain and add it to the move-destination domain.

XSCF> moveboard -c configure -d 1 00-1	
---	--

6. Check the status of the move-source domain.

When the `moveboard(8)` command ends normally, execute the `showdcl(8)` command to display and check the operation status of the move-source domain.

If the `moveboard(8)` command completes abnormally or leaves the board in an unwanted status, refer output messages to identify the problem, then correct it.

XSCF> showdcl -d 0			
DID	LSB	XSB	Status
00			Running
	00	00-0	
	01	00-1	

7. Check the status of the move-destination domain and moved system board.

Execute the `showdcl(8)` command to check the operation status of the move-destination domain, and then execute the `showboards(8)` command to check the status of the moved system board.

XSCF> showdcl -d 1			
DID	LSB	XSB	Status
01			Running
	00	01-0	
	01	00-1	

XSCF> showboards 00-1							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-1	01(01)	Assigned	y	y	y	Passed	Normal



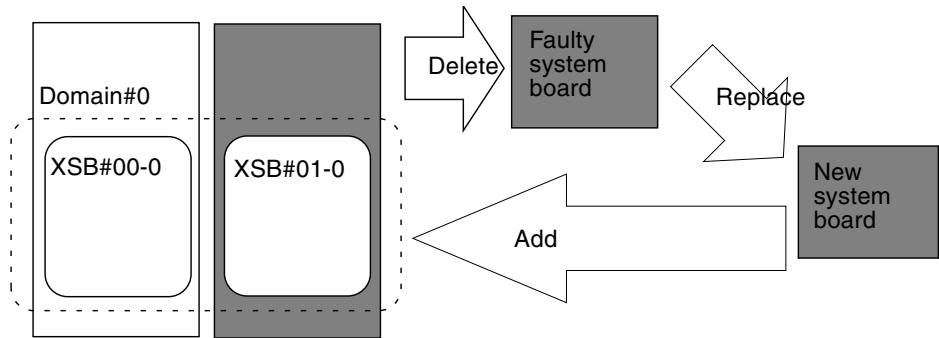
4.5 Examples: Replacing a System Board

This section provides examples of operations to replace a system board in a domain. The examples illustrate replacement of a system board in a Uni-XSB environment and a system board in a Quad-XSB environment. In each sample operation, a procedure conforming to [Section 4.1.4, “Flow: Replacing a System Board” on page 4-5](#), is used, and the system board shown in each figure is replaced using the XSCF shell.

Note – You cannot use DR to replace a system board in a midrange server because replacing a system board replaces an MBU. To replace a system board in a midrange server, you must turn off the power for all domains, then perform a hardware replacement.

4.5.1 Example: Replacing a Uni-XSB System Board

FIGURE 4-8 Example: Replacing a Uni-XSB System Board



1. Login to XSCF.
2. Check the status of the domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the domain. Based on the operation status of the domain, determine whether to perform the DR operation or replace the system board after stopping the domain.

```
XSCF> showdcl -d 0
DID   LSB   XSB   Status
00
      00   00-0   Running
      01   01-0
```

3. Check the status of the system board to be replaced.

Execute the `showboards(8)` command to display system board information, and then check the status of the system board to be deleted. The DR operation for replacement may not be possible if the board to be replaced does not support the DR delete operation.

```
XSCF> showboards 01-0
XSB   DID(LSB)  Assignment  Pwr   Conn  Conf  Test   Fault
-----
01-0  00(01)      Assigned    y     y     y     Passed Normal
```

4. Delete the system board.

Execute the `deleteboard(8)` command to delete the system board.

```
XSCF> deleteboard -c disconnect 01-0
```

5. Check the status of the system board.

Execute the `showboards(8)` command to display system board information, and then check the status of the system board.

```
XSCF> showboards 01-0
```

XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault
01-0	00(01)	Assigned	y	n	n	Passed	Normal

6. Physically replace the system board.

Execute the `replacefru(8)` command, then follow the displayed instructions to replace the system board per the Hot Replacement procedure. For information about Hot Replacement, see the *SPARC Enterprise M8000/M9000 Servers Service Manual*.

```
XSCF> replacefru
```

7. Check the status of the replaced system board.

Execute the `showboards(8)` command to display system board information, and then check the status of all related system boards and confirm their registration in the DCL.

If necessary to change the system board configuration (e.g., number of divisions), do so by using the `setupfru(8)` command. If the system board is not registered in the DCL, register it in the DCL for the target domain by using the `setdcl(8)` command.

```
XSCF> showboards 01-0
```

XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault
01-0	00(01)	Assigned	y	n	n	Passed	Normal

8. Check the status of the domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the domain. Based on the operation status of the domain, determine whether to perform the DR operation or reboot the domains.

```
XSCF> showdcl -d 0
DID   LSB   XSB   Status
00                Running
      00    00-0
      01    01-0
```

9. Add the new system board to the domain.

Execute the `addboard(8)` command to add the system board to the move-destination domain.

```
XSCF> addboard -c configure -d 0 01-0
```

10. Check the status of the domain and added system board.

When the `addboard(8)` command ends normally, execute the `showdcl(8)` command to check the operation status of the domain, and then execute the `showboards(8)` command to check the status of the added system board.

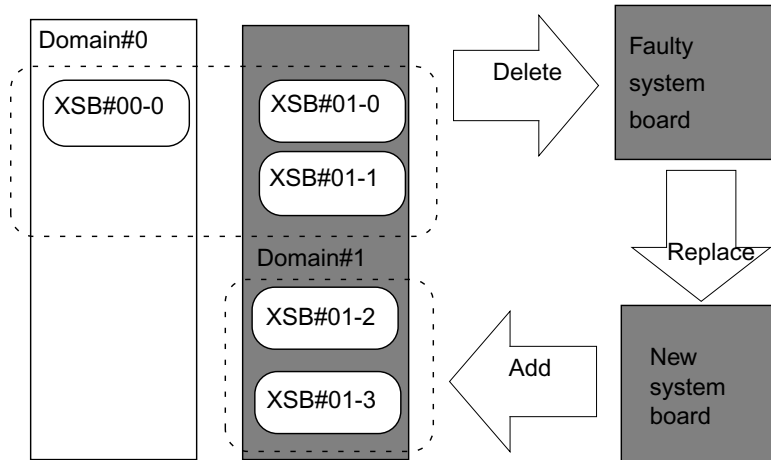
If the `addboard(8)` command completes abnormally or leaves the board in an unwanted status, refer to output messages to identify the problem, then correct it.

```
XSCF> showdcl -d 0
DID   LSB   XSB   Status
00                Running
      00    00-0
      01    01-0
```

```
XSCF> showboards 01-0
XSB   DID(LSB)  Assignment  Pwr  Conn  Conf  Test  Fault
-----
01-0  00(01)      Assigned    y    y     y     Passed Normal
```

4.5.2 Example: Replacing a Quad-XSB System Board

FIGURE 4-9 Example: Replacing a Quad-XSB System Board



1. **Login to XSCF.**
2. **Check the configurations and status of all domains to which the relevant system boards belong.**

Execute the `showdcl(8)` command to display domain information, and then check the configurations and operation status of all domains to which the relevant XSBs belong.

Based on the configurations and operation status of the domains, determine whether to perform the DR operation or replace the replacement-target system board after stopping the domains. If a domain is configured by only the XSBs in the PSB to be replaced, the DR operation for replacement is disabled, and the domain must be stopped for replacement.

In this example, domain #1 has a configuration that requires it to be stopped for system board replacement.

```

XSCF> showdcl -a
DID  LSB   XSB   Status
00
      00    00-0
      01    01-0
      02    01-1
-----
01
      00    01-2
      01    01-3
Running
Running

```

3. Check the status of all related system boards.

Execute the showboards(8) command to display system board information, and then check the status of all system boards related to the PSB to be replaced. The DR operation for replacement may not be possible if the board to be replaced does not support the DR delete operation.

```

XSCF> showboards -a
XSB   DID(LSB)  Assignment  Pwr  Conn  Conf  Test  Fault
-----
00-0  00(00)      Assigned    y    y     y     Passed Normal
01-0  00(01)      Assigned    y    y     y     Passed Normal
01-1  00(02)      Assigned    y    y     y     Passed Normal
01-2  01(00)      Assigned    y    y     y     Passed Normal
01-3  01(01)      Assigned    y    y     y     Passed Normal

```

4. Delete all system boards related to the CMU to be replaced.

Execute the deleteboard(8) command to delete the system boards, and then assign the boards to a domain that permits the DR operation.

```

XSCF> deleteboard -c disconnect 01-0 01-1

```

5. Power off Domain #1 so the CMU can be replaced.

Execute the poweroff(8) command so that the CMU being replaced will not be in use by domain #1.

```

XSCF> poweroff -d 1

```

6. Check the status of all related system boards.

Execute the `showboards(8)` command to display system board information, and then check the status of all related system boards.

XSCF> showboards -a							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-0	00(00)	Assigned	y	y	y	Passed	Normal
01-0	00(01)	Assigned	y	n	n	Passed	Normal
01-1	00(02)	Assigned	y	n	n	Passed	Normal
01-2	01(00)	Assigned	y	n	n	Passed	Normal
01-3	01(01)	Assigned	y	n	n	Passed	Normal

7. Physically replace the system board.

Execute the `replacefru(8)` command, then follow the displayed instructions to replace the system board per the Hot Replacement procedure. For information about Hot Replacement, see the *SPARC Enterprise M8000/M9000 Servers Service Manual*.

```
XSCF> replacefru
```

8. Check the status of the replaced system board.

Execute the `showboards(8)` command to display system board information, and then check the status of the system board to be added and confirm its registration in the DCL.

If you need to change the PSB configuration, use the `setupfru(8)` command. If the system board is not registered in the DCL, register it in the DCL for the target domain by using the `setdcl(8)` command.

XSCF> showboards -a								
XSB	DID	LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

00-0	00(00)		Assigned	y	y	y	Passed	Normal
01-0	00(01)		Assigned	y	n	n	Passed	Normal
01-1	00(02)		Assigned	y	n	n	Passed	Normal
01-2	01(00)		Assigned	y	n	n	Passed	Normal
01-3	01(01)		Assigned	y	n	n	Passed	Normal

9. Check the status of all related domains.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of all related domains. Based on the operation status of the domain, determine whether to perform the DR operation or reboot the domains.

XSCF> showdcl -a			
DID	LSB	XSB	Status
00			Running
	00	00-0	
	01	01-0	
	02	01-1	

01			Powered Off
	00	01-2	
	01	01-3	

10. Add the new system board to the domain.

Execute the `addboard(8)` command in the domain to add the new system board.

XSCF> addboard -c configure -d 0 01-0 01-1

11. Check the status of the related domains and system boards.

Execute the `showdcl(8)` command to check the operation status of related domains, and then execute the `showboards(8)` command to check the status of related system boards.

In this example, domain #1 is booted by power-on in this stage.

XSCF> poweron -d 1

XSCF> showdcl -a			
DID	LSB	XSB	Status
00			Running
	00	00-0	
	01	01-0	
	02	01-1	

01			Running
	00	01-2	
	01	01-3	

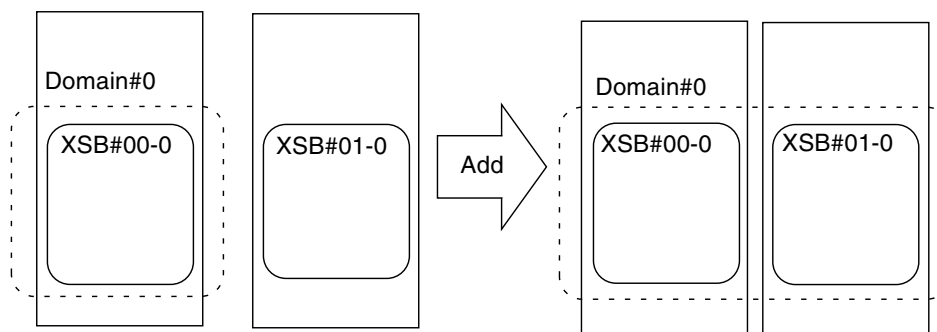
XSCF> showboards -a							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault
00-0	00(00)	Assigned	y	y	y	Passed	Normal
01-0	00(01)	Assigned	y	y	y	Passed	Normal
01-1	00(02)	Assigned	y	y	y	Passed	Normal
01-2	01(00)	Assigned	y	y	y	Passed	Normal
01-3	01(01)	Assigned	y	y	y	Passed	Normal

4.6 Examples: Reserving Domain Configuration Changes

This section provides examples of operations to reserve a change in domain configuration by DR. In the examples, the XSCF shell is used to reserve the addition, deletion, and movement of a system board as shown in the given configuration diagram.

4.6.1 Example: Reserving a System Board Add

FIGURE 4-10 Example: Reserve a System Board Add



1. Login to XSCF.

2. Check the status of the system board to be added.

Execute the `showboards(8)` command to display system board information, and then check the status of the system board to be added and confirm its registration in the DCL.

If you need to change the PSB configuration, use the `setupfru(8)` command. If the system board is not registered in the DCL, register the system board in the DCL for the target domain by using the `setdcl(8)` command.

XSCF> showdcl -d 0			
DID	LSB	XSB	Status
00			Running
	00	00-0	
	01	01-0	

XSCF> showboards 01-0							
XSB	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault

01-0	SP	Available	y	n	n	Passed	Normal

3. Reserve the addition of the system board.

Execute the `addboard(8)` command to reserve the addition of the system board.

XSCF> addboard -c reserve -d 0 01-0
--

4. Check the status of the system board.

When the `addboard(8)` command ends normally, execute the `showboards(8)` command to display system board information, and then check the status of the target system board and confirm that the addition of the target system board has been reserved.

If the `addboard(8)` command ends abnormally, identify the cause of the abnormality based on the messages output, and then take appropriate corrective action.

XSCF> showboards -v 01-0									
XSB	R	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault	COD

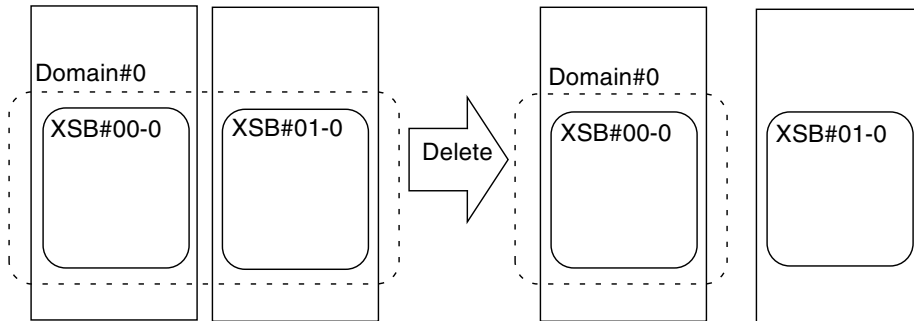
01-0	*	SP	Available	y	n	n	Passed	Normal	n

5. Stop or reboot the domain.

Stop or reboot the domain. This operation executes the reserved deletion of the system board as a change in domain configuration.

4.6.2 Example: Reserving a System Board Delete

FIGURE 4-11 Example: Reserving a System Board Delete



1. Login to XSCF.

2. Check the status of the domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the domain. Based on the operation status of the domain, determine whether to perform the DR operation or change the domain configuration.

```
XSCF> showdcl -d 0
DID  LSB  XSB  Status
00           Running
      00    00-0
      01    01-0
```

3. Check the status of the system board to be deleted.

Execute the `showboards(8)` command to display system board information, and then check the status of the system board to be deleted.

```
XSCF> showboards 01-0
XSB  DID(LSB)  Assignment  Pwr  Conn  Conf  Test  Fault
-----
01-0 00(01)    Assigned    y    y     y     Passed Normal
```

4. Reserve the deletion of the system board.

Execute the `deleteboard(8)` command to reserve deletion of the system board.

```
XSCF> deleteboard -c reserve 01-0
```


5. Check the reserved status of the system board.

Execute the `showboards(8)` command with the `-v` option specified to display system board information, and then confirm that deletion of the system board has been reserved.

XSCF> showboards -v 01-0									
XSB	R	DID(LSB)	Assignment	Pwr	Conn	Conf	Test	Fault	COD

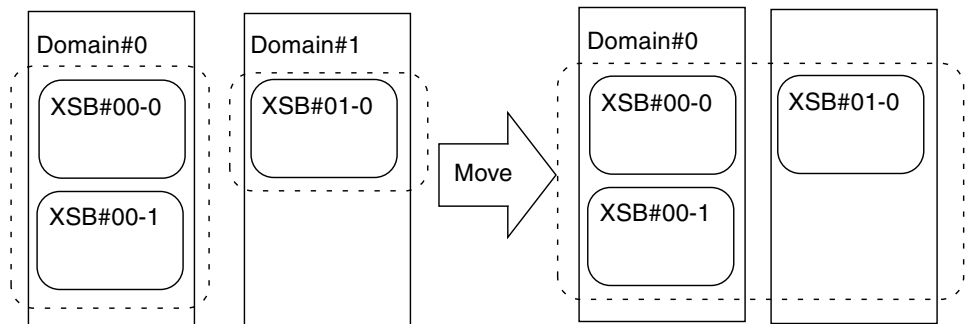
01-0	*	00(01)	Assigned	y	y	y	Passed	Normal	n

6. Stop or reboot the domain.

This operation changes the domain's configuration, reserving deletion of the system board.

4.6.3 Example: Reserving a System Board Move

FIGURE 4-12 Example: Reserving a System Board Move



1. Login to XSCF.

2. Check the status of the move-source domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the move-source domain.

XSCF> showdcl -d 1			
DID	LSB	XSB	Status
01			Running
	00	01-0	

3. Check the status of the move-destination domain.

Execute the `showdcl(8)` command to display domain information, and then check the operation status of the move-destination domain. Based on the operation status of the move-source and move-destination domains, determine whether to perform the DR operation or change the domain configuration.

```
XSCF> showdcl -d 0
DID   LSB   XSB   Status
00                Running
      00    00-0
      01    00-1
      02    01-0
```

4. Check the status of the system board to be moved.

Execute the `showboards(8)` command to display system board information, and then check the status of the system board to be moved.

```
XSCF> showboards 01-0
XSB   DID(LSB)  Assignment  Pwr   Conn  Conf  Test   Fault
-----
01-0  01(00)      Assigned    y     y     y     Passed Normal
```

5. Reserve the move of the system board.

Execute the `moveboard(8)` command to reserve deletion of the system board from the move-source domain and addition of the system board to the move-destination domain.

```
XSCF> moveboard -c reserve -d 0 01-0
```

6. Check the reserved status of the system board.

Execute the `showboards(8)` command with the `-v` option specified to display system board information, and confirm that moving the system board to the move-destination domain has been reserved.

```
XSCF> showboards -v 01-0
XSB   R   DID(LSB)  Assignment  Pwr   Conn  Conf  Test   Fault  COD
-----
01-0  *   01(00)      Assigned    y     y     y     Passed Normal  n
```

7. Stop the move-source domain.

Stop the move-source domain. This operation executes the reserved deletion of the system board from the move-source domain as a change in domain configuration, and the reservation of the addition of the system board to the move-destination domain.

8. Check the status of the move-destination domain and moved system board.

Execute the `showdcl(8)` command to check the operation status of the move-destination domain, and then execute the `showboards(8)` command to check the status of the system board and confirm that addition of the system board has been reserved in the move-destination domain.

```
XSCF> showdcl -d 0
DID  LSB   XSB   Status
00               Running
      00   00-0
      01   00-1
      02   01-0
```

```
XSCF> showboards 01-0
XSB   DID(LSB)  Assignment  Pwr  Conn  Conf  Test   Fault
-----
01-0  00(02)    Assigned    y    n     n     Passed Normal
```

9. Add the system board to the move-destination domain.

Execute the `addboard(8)` command to add the system board to the move-destination domain. If the move-destination domain is in stopped status, the system board will be added the next time the domain is booted.

```
XSCF> addboard -c configure -d 0 01-0
```

10. Check the status of the move-destination domain and moved system board.

Execute the `showdcl(8)` command to check the operation status of the move-destination domain, and then execute the `showboards(8)` command to check the status of the moved system board.

```
XSCF> showdcl -d 0
DID  LSB   XSB   Status
00               Running
      00   00-0
      01   00-1
      02   01-0
```

```
XSCF> showboards 01-0
XSB   DID(LSB)  Assignment  Pwr  Conn  Conf  Test   Fault
-----
01-0  00(02)    Assigned    y    y     y     Passed Normal
```


Message Meaning and Handling

This appendix explains the meaning and handling of DR-related messages.

A.1 Solaris OS Messages

This section explains the console messages printed by the DR driver. The output for messages that do not have an output field is console.

A.1.1 Transition Messages

DR: PROM detach board X

[Explanation] Detach system board X.

OS configure dr@0:SBX::cpuY

[Explanation] Configure CPU Y on system board X.

OS configure dr@0:SBX::memory

[Explanation] Configure memory on system board X.

OS configure dr@0:SBX::pciY

[Explanation] Configure PCI Y on system board X.

OS unconfigure dr@0:SBX::cpuY

[Explanation] Unconfigure CPU Y on system board X.

OS unconfigure dr@0:SBX::memory

[Explanation] Unconfigure memory on system board X.

OS unconfigure dr@0:SBX::pciY

[Explanation] Unconfigure PCI Y on system board X.

suspending <device name>@<device info> (aka <alias>)

[Explanation] Suspending the device

suspending <device name>@<device info>

[Explanation] Suspending the device

resuming <device name>@<device info> (aka <alias>)

[Explanation] Resuming the device

resuming <device name>@<device info>

[Explanation] Resuming the device

DR: resuming kernel daemons...

[Explanation] Resuming kernel daemons

DR: resuming user threads...

[Explanation] Resuming user threads

DR: suspending user threads...

[Explanation] Suspending user threads

DR: resume COMPLETED

[Explanation] DR resume operation completed

DR: checking devices...

[Explanation] Checking if there are any DR unsafe device drivers loaded

DR: dr_suspend invoked with force flag

[Explanation] User command requests DR operation without checking for unsafe conditions

DR: suspending drivers

[Explanation] Suspending device drivers

DR: in-kernel unprobe board <board>

[Explanation] Unprobing the board.

A.1.2 PANIC Messages

URGENT_ERROR_TRAP is detected during FMA.

[Explanation] A fatal HW error was encountered during copy-rename.

[Remedy] Please contact customer service.

Failed to remove CMP X LSB NN

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

drmach_copy_rename_fini: invalid op code <opcode>

[Explanation] Internal error happened during kernel migration.

[Remedy] Please contact customer service.

Cannot locate source or target board

[Explanation] Cannot locate source or target board during kernel migration.

[Remedy] Please contact customer service.

Could not update device nodes

[Explanation] Could not update device nodes during kernel migration.

[Remedy] Please contact customer service.

Irrecoverable FMEM error <error code>

[Explanation] Internal error during kernel migration

[Remedy] Please contact customer service.

scf_fmем request failed error code = 0x<error code>

[Explanation] Internal error during kernel migration

[Remedy] Please contact customer service.

scf_fmем_end() failed rv=0x<error code>

[Explanation] Internal error during kernel migration

[Remedy] Please contact customer service.

CPU nn hang during Copy Rename

[Explanation] A fatal HW error was encountered during copy-rename.

[Remedy] Please contact customer service.

A.1.3 Warning Messages

megabytes not available to kernel cage

[Explanation] Lack of memory resource deleted.

[Remedy] Detach the board, then attach it again.

IKP: init failed

[Explanation] The initial device tree walk to locate the nodes that are interesting to IKP fails.

[Remedy] Please contact customer service.

dr#: failed to alloc soft-state

[Explanation] Failed to allocate soft-state due to lack of the memory resource

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

dr#: module not yet attached

[Explanation] Failed to attach the DR driver.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

dr_add_memory_spans: unexpected kphysm_add_memory_dynamic return value X; basepfm=Y, npages=Z

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

dr_cancel_cpu: failed to disable interrupts on cpu X

[Explanation] Failed to disable interrupt on CPU X.

[Remedy] Disable interrupt on cpu X with `psradm -I` and if this command fails again, respond in the manner directed by command message.

`dr_cancel_cpu: failed to online cpu X`

[Explanation] Failed to online CPU X.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

`dr_cancel_cpu: failed to power-on cpu X`

[Explanation] Failed to power-on cpu X

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

`dr_copyin_iocmd: (32bit) failed to copyin sbdcmd-struct`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_copyin_iocmd: failed to copyin options`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_copyin_iocmd: failed to copyin sbdcmd-struct`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_copyout_errs: (32bit) failed to copyout`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_copyout_errs: failed to copyout`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_copyout_iocmd: (32bit) failed to copyout sbdcmd-struct`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_copyout_iocmd: failed to copyout sbdcmd-struct`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_status: failed to copyout status for board #`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_status: unknown dev type (#)`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_dev2devset: invalid cpu unit# = #`

[Explanation] Invalid argument is passed to the driver or there may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

`dr_dev2devset: invalid io unit# = #`

[Explanation] Invalid argument is passed to the driver or there may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

`dr_dev2devset: invalid mem unit# = #`

[Explanation] Invalid argument is passed to the driver or there may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

`dr_exec_op: unknown command (#)`

[Explanation] Invalid argument is passed to the driver or there may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

`dr_post_attach_cpu: cpu_get failed for cpu X`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_pre_release_cpu: thread(s) bound to cpu X`

[Explanation] The thread in the process is bound to the detached CPU X.

[Remedy] Check if the process bound to the CPU exists by `pbind(1M)` command. If it exists, unbind from the CPU and repeat the action.

`dr_pre_release_mem: unexpected kphysm_del_release return value #`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_pt_ioctl: invalid passthru args`

[Explanation] Invalid argument is passed to the driver or there may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

`dr_release_mem: unexpected kphysm error code #, id 0xX`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_release_mem_done: mem-unit (X.Y): deleted memory still found in phys_install`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_release_mem_done: target: mem-unit (X.Y): deleted memory still found in phys_install`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_release_mem_done: unexpected kphysm_del_release return value #`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_reserve_mem_spans memory reserve failed. Unexpected kphysm_del_span return value #; basepfn=# npages=#`

[Explanation] The selected target board can no longer fit all the kernel memory of the source board since it was last selected.

[Remedy] Please repeat the action. If the problem remains, please contact customer service.

`dr_release_mem_done: <device path>: error <error code> noted`

[Explanation] Error noted for a device during releasing memory.

[Remedy] Please contact customer service.

`drmach_log_sysevent failed (rv #) for SBX`

[Explanation] There may be minor error in the system.

[Remedy] Please contact customer service.

`unexpected kcase_range_add return value #`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`unexpected kcase_range_delete return value #`

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

`dr_select_mem_target: no memlist for mem-unit X, board Y`

[Explanation] Detected inconsistency of the memory unit information in the DR driver's internal data.

[Remedy] Please contact customer service.

`FAILED to suspend <device name>@<device info>`

[Explanation] Device suspension failed

[Remedy] Repeat the action. If the message persists, please contact customer service.

`FAILED to resume <device name>@<device info>`

[Explanation] The device cannot be resumed.

[Remedy] Please contact customer service.

`dr_stop_user_threads: failed to stop thread: process=<name>, pid=#`

[Explanation] Cannot stop the user thread.

[Remedy] Please contact customer service.

Cannot stop user thread: <pid> <pid> ...

[Explanation] The DR driver cannot stop all the user processes in the list.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Cannot setup memory node

[Explanation] DR is unable to read the HW information for the memory device.

[Remedy] Please contact customer service.

Kernel Migration fails. 0xX

[Explanation] Kernel data migration failed as a result of DR detach.

[Remedy] Please contact customer service.

TOD on board X has already been attached.

[Explanation] Time of Date Clock on board X has been attached. This may be a minor inconsistency in the system.

[Remedy] Please contact customer service.

TOD on board X has already been removed.

[Explanation] Time of Date Clock on board X has been removed. This may be a minor inconsistency in the system.

[Remedy] Please contact customer service.

Unable to detach last available TOD on board X

[Explanation] Detaching the system board will result in detaching the last available Time of Date clock.

[Remedy] Attach another system board before detaching.

Device in fatal state

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

I/O error: dr@0:SBX::memory

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Invalid argument

[Explanation] Invalid argument is passed to the driver or there may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Invalid argument: #####

[Explanation] Invalid argument is passed to the driver.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Invalid CPU/core state

[Explanation] DR finds some faulty CPU that fails to power on.

[Remedy] Please contact customer service.

No error

[Explanation] Invalid argument is passed to the driver or there may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

no error: dr@0:SBX::memory

[Explanation] There may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Unrecognized platform command: #

[Explanation] Invalid argument is passed to the driver or there may be inconsistency in the system.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Bad address: dr@0:SBX::memory

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Cannot read property value: device node XXXXXX property: name

[Explanation] Fail to get the property from OBP.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Cannot read property value: property: scf-cmd-reg

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Cannot find mc-opl interface

[Explanation] DR cannot locate mc-opl driver's suspend/resume interface. mc-opl is probably not loaded or incorrect version is used.

[Remedy] Please contact customer service.

Cannot find scf_fmeme interface

[Explanation] DR cannot locate SCF driver's FMEM interface functions. SCF is probably not loaded or incorrect version is used.

[Remedy] Please contact customer service.

Device busy: dr@0:SBX:pciY

[Explanation] Some devices are still referenced.

[Remedy] Confirm that all devices in this pci slot are not in use and repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Device driver failure: path

[Explanation] The device driver failed in attach or detach operation.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Error setting up FMEM buffer

[Explanation] DR fails to allocate enough memory to perform copy rename.

[Remedy] Retry and if the problem persists, contact customer service.

Failed to off-line: dr@0:SBX::cpuY

[Explanation] Failed to off-line CPU Y on board X.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Failed to on-line: dr@0:SBX::cpuY

[Explanation] Failed to online CPU Y on system board X.

[Remedy] Online CPU with `psradm -n`. If it fails to online CPU, and if this command fails again, respond in the manner directed by command message.

[Output] Console and Standard Output

Failed to start CPU: dr@0:SBX::cpuY

[Explanation] Failed to start CPU Y on system board X.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Failed to stop CPU: dr@0:SBX::cpuY

[Explanation] Failed to stop CPU Y on system board X.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Firmware deprobe failed: SBX::cpuY

[Explanation] Failed to deprobe the CPU.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Firmware probe failed: SBX

[Explanation] Failed to probe the board.

[Remedy] Respond in the manner directed by the other message.

[Output] Console and Standard Output

Insufficient memory: dr@0:SBX::memory

[Explanation] Detected lack of memory resource.

[Remedy] Check the size of memory, detach the board and attach again. If the problem still exists, please contact customer service.

[Output] Console and Standard Output

Internal error: dr.c #

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Internal error: dr_mem.c #

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Invalid argument: dr@0:SBX::memory

[Explanation] The memory board X is currently involved in other DR operation and cannot be detached.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Invalid board number: X

[Explanation] Invalid board number.

[Remedy] Check the board number and repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Kernel cage is disabled:

[Explanation] The kernel cage memory feature is disabled.

[Remedy] Ensure /etc/system is edited to enable kernel cage memory.

[Output] Console and Standard Output

Memory operation failed: dr@0:SBX::memory

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Memory operation refused: dr@0:SBX::memory

[Explanation] The DR operation is refused.

[Remedy] Respond in the manner directed by the other message.

Memory operation cancelled: dr@0:SBX::memory

[Explanation] The DR operation is canceled.

[Remedy] Respond in the manner directed by the other message.

No device(s) on board: dr@0:SBX

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Non-relocatable pages in span: dr@0:SBX::memory

[Explanation] There is non-relocatable (kernel) memory on the system board.

[Remedy] The target board with kernel memory cannot be disconnected by DR. It depends on the hardware model if you can remove a kernel memory board or not.

Operator confirmation for quiesce is required: dr@0:SBX::memory

[Explanation] There is non-relocatable (kernel) memory on the board.

[Remedy] The target board with kernel memory cannot be disconnected by DR.

[Output] Console and Standard Output

Unexpected internal condition: drmach.c #

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Unexpected internal condition: SBX

[Explanation] The attempt to call OBP failed.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Device busy: dr@0:SBX::cpuY

[Explanation] CPU Y on system board X is busy during release operation.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Insufficient memory: dr@0:SBX::cpuY

[Explanation] Lack of memory resources detected.

[Remedy] Check the size of available memory and detach the board. If the problem still exists, please contact customer service.

[Output] Console and Standard Output

Invalid argument: dr@0:SBX::cpuY

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Invalid state transition: dr@0:SBX::cpuY

[Explanation] Invalid state transition of cpu Y on system board X

[Remedy] Repeat the action. If the problem still exists, please contact customer service.

[Output] Console and Standard Output

Invalid state transition: dr@0:SBX::memory

[Explanation] Invalid state transition of memory on system board X

[Remedy] Repeat the action. If the problem still exists, please contact customer service.

[Output] Console and Standard Output

Invalid state transition: dr@0:SBX::pciY

[Explanation] Invalid state transition of pci Y on system board X

[Remedy] Repeat the action. If the problem still exists, please contact customer service.

[Output] Console and Standard Output

No such device: dr@0:SBX::cpuY

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Operation already in progress: dr@0:SBX::cpuY

[Explanation] The operation on cpu Y on system board X is in progress.

[Remedy] Repeat the action. If the problem still exists, please contact customer service.

[Output] Console and Standard Output

dr_move_memory: failed to quiesce OS for copy-rename

[Explanation] There is a task not suspended in the process.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

No available memory target: dr@0:SBX::memory

[Explanation] The system board cannot be detached because it contains kernel memory and there is no available target memory board.

[Remedy] Add new system board and then try the detach operation again.

[Output] Console and Standard Output

Unsafe driver present: <driver name|major #> ...

[Explanation] DR driver found DR unsafe drivers in the system.

[Remedy] Unload the unsafe drivers and try the DR operation again.

[Output] Console and Standard Output

Device failed to resume: <driver name|major #> ...

[Explanation] Devices on the list failed to resume

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Device failed to suspend: <driver name|major #> ...

[Explanation] Devices on the list failed to suspend

[Remedy] Please contact customer service.

[Output] Console and Standard Output

Operation not supported: ERROR

[Explanation] Invalid operation.

[Remedy] Repeat the action. If this error message appears again, please contact customer service.

[Output] Console and Standard Output

Cannot setup resource map opl-fcodemem

[Explanation] Resource memory mapping cannot be set up.

[Remedy] Please contact customer service.

opl_cfg failed to load, error=<errno>

[Explanation] opl_cfg module failed to load.

[Remedy] Please contact customer service.

IKP: failed to read HWD header

[Explanation] The header of the hardware descriptor could not be read.

[Remedy] Please contact customer service.

IKP: create cpu (<board>-<chip>-<core>-<cpu>) failed

[Explanation] There was a problem creating the device node for a cpu.

[Remedy] Please contact customer service.

IKP: create core (<board>-<chip>-<core>) failed

[Explanation] There was a problem creating the device node for a core.

[Remedy] Please contact customer service.

IKP: create chip (<board>-<chip>) failed

[Explanation] There was a problem creating the device node for a chip.

[Remedy] Please contact customer service.

IKP: create pseudo-mc (<board>) failed

[Explanation] There was a problem creating the pseudo-mc device node for the board.

[Remedy] Please contact customer service.

opl_claim_memory - unable to allocate contiguous memory of size zero

[Explanation] A claim request with size zero was issued by the fcode interpreter.

[Remedy] If DR failed after this message, please contact customer service.

opl_claim_memory - vhint is not zero vhint=0x<vhint> - Ignoring Argument

[Explanation] A claim request with a nonzero hint came from the fcode interpreter.

[Remedy] If DR failed after this message, please contact customer service.

opl_claim_memory - unable to allocate contiguous memory

[Explanation] Memory allocation failed for the fcode interpreter.

[Remedy] If DR failed after this message, please contact customer service.

opl_get_fcode: Unable to copy out fcode image

[Explanation] Failed to copy out the fcode image to the ecode daemon.

[Remedy] If DR failed after this message, please contact customer service.

opl_get_hwd_va: Unable to copy out cmuch descriptor for <addr>

[Explanation] Failed to copy out the cmuch HWD to the ecode daemon.

[Remedy] If DR failed after this message, please contact customer service.

opl_get_hwd_va: Unable to copy out pcich descriptor for <addr>

[Explanation] Failed to copy out the pcich HWD to the ecode daemon.

[Remedy] If DR failed after this message, please contact customer service.

IKP: create leaf (<board>--<channel>--<leaf>) failed

[Explanation] A device node was not created for a PCI device.

[Remedy] If DR failed after this message, please contact customer service.

IKP: Unable to probe PCI leaf (<board>--<channel>--<leaf>)

[Explanation] The fcode interpreter returned a bad status for the probe.

[Remedy] If DR failed after this message, please contact customer service.

IKP: Unable to bind PCI leaf (<board>--<channel>--<leaf>)

[Explanation] The driver binding fails, after the leaf has been probed.

[Remedy] If DR failed after this message, please contact customer service.

IKP: destroy pci (<board>--<channel>--<leaf>) failed

[Explanation] The node was not destroyed.

[Remedy] Please contact customer service.

IKP: destroy pseudo-mc (<board>) failed

[Explanation] The node was not destroyed.

[Remedy] Please contact customer service.

IKP: destroy chip (<board>-<chip>) failed

[Explanation] The node was not destroyed.

[Remedy] Please contact customer service.

dr_del_mlist_query: mlist=NULL

[Explanation] The memory list to be deleted is NULL. This warning is also shown at memoryless board.

[Remedy] Please ignore this message on memoryless boards. If DR failed after this message, please contact customer service.

dr_memlist_canfit: memlist_dup failed

[Explanation] System might have run out of memory. Or there is a memoryless board.

[Remedy] Please ignore this message on memoryless boards. If DR failed after this message, please check if the system has enough memory resource and repeat the action. If the error remains, please contact customer service.

Cannot get floating-boards proplen

[Explanation] Failed to get property information of floating-boards.

[Remedy] Please contact customer service.

Cannot get floating-boards prop

[Explanation] Failed to get property information of floating-boards.

[Remedy] Please contact customer service.

Device node 0x<dip> has invalid property value, board#=<board>

[Explanation] The device node has invalid property value.

[Remedy] Please contact customer service.

DR - IKP initialization failed

[Explanation] IKP initialization failed

[Remedy] Please contact customer service.

I/O callback failed in pre-release

[Explanation] I/O callback failed in pre-release

[Remedy] Please contact customer service.

I/O callback failed in post-attach

[Explanation] I/O callback failed in post-attach

[Remedy] Please contact customer service.

Kernel Migration fails. 0x%x

[Explanation] Internal error happened during kernel migration.

[Remedy] Please contact customer service.

Failed to add CMP%d on board %d

[Explanation] CPU failed to power-on during DR attach.

[Remedy] Please contact customer service.

FMEM error = 0x<error code>

[Explanation] DR detects error during the copy rename operation.

[Remedy] Please contact customer service.

Cannot proceed; Board is configured or busy

[Explanation] Board cannot be disconnected because its status is busy.

[Remedy] Repeat the action; If the problem still exists, please contact customer service.

drmach parameter is not a valid ID

[Explanation] ID parameter for status command is not a valid ID.

[Remedy] Correct the format of the ID parameter.

drmach parameter is inappropriate for operation

[Explanation] Parameter(s) for DR command specified incorrectly.

[Remedy] Correct the parameter(s).

drmach_node_ddi_get_parent: NULL dip

[Explanation] Internal error during DR operation.

[Remedy] Please contact customer service.

drmach_node_ddi_get_parent: NULL parent dip

[Explanation] Internal error during DR operation.

[Remedy] Please contact customer service.

Failed to remove CMP xx on board n

[Explanation] Internal error during DR operation.

[Remedy] Please contact customer service.

scf_fmем_cancel() failed rv=0x<error code>

[Explanation] Internal error during kernel migration.

[Remedy] Please contact customer service.

scf_fmем_start error

[Explanation] SCF fails to start the FMEM operation. It is possible that there is HW error and there is no SCF path or the SP is down.

[Remedy] Please contact customer service.

scf_fmем_cancel error

[Explanation] DR detects some error in the copy rename process and informs SCF to cancel the operation. However, SCF fails to cancel the operation.

[Remedy] Please contact customer service.

Unknown cpu implementation

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

dr_mem_ecache_scrub:address (0x%lx) not on page boundary

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

unexpected kcase_range_delete_post_mem_del return value

[Explanation] There may be inconsistency in the system.

[Remedy] Please contact customer service.

opl_fc_ops_free_handle: DMA seen!

[Explanation] A DMA resource was found in the resource list that is being freed while the board is unprobed.

[Remedy] Please contact customer service.

opl_fc_ops_free: unknown resource type <type>

[Explanation] An unknown resource type was found in the resource list that is being freed while the board is unprobed.

[Remedy] Please contact customer service.

VM viability test failed: dr@0:SBX::memory

[Explanation] There is not enough real memory to detach memory on system board X.

[Remedy] Check the amount of available real memory, and repeat the action. If this error message appears again, please contact our customer service.

DR parallel copy timeout

[Explanation] Internal error happened during kernel migration.

[Remedy] Retry and if the problem persists, contact customer service.

SCF busy

[Explanation] SCF was busy during kernel migration.

[Remedy] Retry and if the problem persists, contact customer service.

SCF I/O Retry Error

[Explanation] Internal error happened during kernel migration.

[Remedy] Please contact customer service.

FMEM command timeout

[Explanation] Internal error happened during kernel migration.

[Remedy] Please contact customer service.

Hardware error

[Explanation] Internal error happened during kernel migration.

[Remedy] Please contact customer service.

FMEM operation terminated

[Explanation] Internal error happened during kernel migration.

[Remedy] Please contact customer service.

Memory copy error

[Explanation] Memory copy error happened during kernel migration.

[Remedy] Retry and if the problem persists, contact customer service.

SCF error

[Explanation] Internal error happened during kernel migration.

[Remedy] Please contact customer service.

A.2 Command Messages

A.2.1 addboard

XSB#XX-X will be assigned to DomainID X. Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not.
Input "y" to execute it and "n" to stop it.

XSB#XX-X will be configured into DomainID X. Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not.
Input "y" to execute it and "n" to stop it.

DR operation canceled by operator.

[Explanation] DR operation canceled by operator.

Domain (DomainID X) is not currently running.

[Explanation] Destination domain #0 was not active when "-c configure" was specified.

[Remedy] Execute it by specifying "-c assign".

XSB#XX-X is already assigned to another domain.

[Explanation] The specified system board (XSB#XX-X) has already been assigned to another domain.

[Remedy] XSB has already been assigned to another domain. Confirm the XSB by showboards(8).

XSB#XX-X is not installed.

[Explanation] System board (XSB#XX-X) is not installed.

[Remedy] Specify the wrong XSB. Confirm the XSB by showboards(8).

XSB#XX-X is currently unavailable for DR. Try again later.

[Explanation] The specified system board (XSB#XX-X) has already been executed by another operation.

[Remedy] DR or power-off has been executing for another session. Try again after waiting for a while, with the confirmation of the XSB status.

XSB#XX-X has not been registered in DCL.

[Explanation] System board (XSB#XX-X) is not registered to DCL.

[Remedy] Register DCL information by setdc(8).

Another DR operation is in progress. Try again later.

[Explanation] The specified system board (XSB#XX-X) has already been executed by another session.

[Remedy] DR operation is in progress by another session. Try again after waiting for a while, with the confirmation of the XSB status.

XSB#XX-X has been detected timeout by DR self test.

[Explanation] The timeout occurred during DR processing because the hardware diagnosis did not complete. There is something wrong with the hardware.

[Remedy] Find out the cause of the DR failure referring monitoring message and errorlog. Replace the failure component.

XSB#XX-X encountered a hardware error. See error log for details.

[Explanation] An error occurred during hardware diagnosis. There is something wrong with the hardware.

[Remedy] Find out the cause of the DR failure referring monitoring message and errorlog. Replace the failure component.

IP address of DSCP path is not specified.

[Explanation] DR cannot communicate with the domain because the DSCP IP Address is not set up or registered.

[Remedy] Register the DSCP IP Address.

An internal error has occurred. This may have been caused by a DR library error.

[Explanation] The DR processing cannot be failed on the domain OS. The error occurred at the DR library.

[Remedy] Find out the cause of the DR failure referring monitoring message and errorlog. Confirm the patch applying status and the XCP version

DR failed. Domain (DomainID X) cannot communicate via DSCP path.

[Explanation] DR processing cannot communicate with the domain. The reasons are that domain is powered off, the DSCP setting is wrong or the error occurs at the DSCP path.

[Remedy] Confirm the domain powered off, DSCP setting, DSCP error with monitoring message and errorlog.

XSB#XX-X could not be configured into DomainID X due to operating system error.

[Explanation] An error occurred from DR library of domain OS at DR process. The error occurred at configuration management of domain OS.

[Remedy] Find out the cause of the DR failure referring monitoring message and console message. Try again after taking out cause.

Invalid parameter.

[Explanation] There is an error in the specified argument or operand.

[Remedy] Confirm the specified argument or operand and execute the command once again.

Permission denied.

[Explanation] Do not have privilege.

[Remedy] Confirm the user privilege and the command privilege. In the case of high-end servers, please also confirm whether command is executed by XSCF on standby side.

The current configuration does not support this operation.

[Explanation] Cannot execute the command in the current configuration, or it is not supported.

[Remedy] Confirm the current hardware configuration and support status.

A hardware error occurred. Please check the error log for details.

[Explanation] Hardware error occurred. Please confirm monitoring message and the error log.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Replace the failure component.

An internal error has occurred. Please contact your system administrator.

[Explanation] DR failed. There is a possibility that DR failed because of an internal error in XSCF.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Please also confirm the XCP version.

Timeout detected during self-test of XSB#XX-X.

[Explanation] Because the hardware diagnosis in DR did not complete, a timeout occurred. There is a possibility that a hardware error occurred.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Replace the failure component.

A.2.2 deleteboard

XSB#XX-X will be unassigned from domain immediately. Continue?
[y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not.
Input "y" to execute it and "n" to stop it.

XSB#XX-X will be unconfigured from domain immediately.
Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not.
Input "y" to execute it and "n" to stop it.

XSB#XX-X will be unassigned from domain after the domain
restarts. Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not.
Input "y" to execute it and "n" to stop it.

DR operation canceled by operator.

[Explanation] DR operation canceled by operator

XSB#XX-X is not installed.

[Explanation] System board (XSB#XX-X) is not installed.

[Remedy] Specify the wrong XSB. Confirm the XSB by showboards(8).

XSB#XX-X is currently unavailable for DR. Try again later.

[Explanation] The specified system board (XSB#XX-X) has already been executed by another operation.

[Remedy] DR or power-off has been executing for another session. Try again after waiting for a while, with the confirmation of the XSB status.

XSB#XX-X has not been registered to DCL.

[Explanation] System board (XSB#XX-X) is not registered to DCL.

[Remedy] Register DCL information by setdc(8).

XSB#XX-X is the last LSB for DomainID X, and this domain is still running. Operation failed.

[Explanation] XSB#XX-X is the last LSB for domain#X.

[Remedy] Power-off the domain by specifying "-c reserve".

IP address of DSCP path is not specified.

[Explanation] DR cannot communicate with the domain because DSCP IP Address is not set up or not registered.

[Remedy] Register the DSCP IP Address.

An internal error has occurred. This may have been caused by a DR library error.

[Explanation] The DR processing cannot be failed on the domain OS. The error occurred at the DR library.

[Remedy] Find out the cause of the DR failure referring monitoring message and errorlog. Confirm the patch applying status and the XCP version.

DR failed. Domain (DomainID X) cannot communicate via DSCP path.

[Explanation] DR processing cannot communicate with the domain. The reasons are that domain is powered off, the DSCP setting is wrong or the error occurs at the DSCP path.

[Remedy] Confirm the domain powered off, DSCP setting, DSCP error with monitoring message and errorlog.

XSB#XX-X could not be unconfigured from DomainID X due to operating system error.

[Explanation] An error occurred from DR library of domain OS at DR process. The error occurred at configuration management of domain OS.

[Remedy] Find out the cause of the DR failure referring monitoring message and console message. Try again after taking out cause.

Invalid parameter.

[Explanation] There is an error in the specified argument or operand.

[Remedy] Confirm the specified argument or operand and execute the command once again.

Permission denied.

[Explanation] Do not have privilege.

[Remedy] Confirm the user privilege and the command privilege. In the case of high-end servers, please also confirm whether command is executed by XSCF on standby side.

A hardware error occurred. Please check the error log for details.

[Explanation] Hardware error occurred. Please confirm monitoring message and the error log.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Replace the failure component.

An internal error has occurred. Please contact your system administrator.

[Explanation] DR failed. There is a possibility that DR failed because of an internal error in XSCF.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Please also confirm the XCP version.

A.2.3 moveboard

XSB#XX-X will be moved from DomainID X to DomainID X immediately. Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not. Input "y" to execute it and "n" to stop it.

XSB#XX-X will be assigned to DomainID X immediately. Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not. Input "y" to execute it and "n" to stop it.

XSB#XX-X will be assigned to DomainID X after DomainID X restarts. Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not.
Input "y" to execute it and "n" to stop it.

DR operation canceled by operator.

[Explanation] DR operation canceled by operator.

Domain (DomainID X) is not currently running.

[Explanation] Destination domain #X was not active when "-c configure" was specified.

[Remedy] Execute it by specifying "-c assign".

XSB#XX-X cannot be moved due to System Board Pool.

[Explanation] The XSB in the system board pool cannot be moved.

[Remedy] Executing addboard command.

XSB#XX-X is not installed.

[Explanation] System board (XSB#XX-X) is not installed.

[Remedy] Specify the wrong XSB. Confirm the XSB by showboards(8).

XSB#XX-X is currently unavailable for DR. Try again later.

[Explanation] The specified system board (XSB#XX-X) has already been executed by another operation.

[Remedy] DR or power-off has been executing for another session. Try again after waiting for a while, with the confirmation of the XSB status.

XSB#XX-X has not been registered in DCL.

[Explanation] System board (XSB#XX-X) is not registered to DCL.

[Remedy] Register DCL information by setdc(8).

Another DR operation is in progress. Try again later.

[Explanation] The specified system board (XSB#XX-X) has already been executed by another session.

[Remedy] DR operation is in progress by another session. Try again after waiting for a while, with the confirmation of the XSB status.

XSB#XX-X is the last LSB for DomainID X, and this domain is still running. Operation failed.

[Explanation] XSB#XX-X is the last LSB for domain#X.

[Remedy] Power off the domain by specifying "-c reserve".

XSB#XX-X detected timeout by DR self test.

[Explanation] The timeout occurred during DR processing because the hardware diagnosis did not complete. There is something wrong with the hardware.

[Remedy] Find out the cause of the DR failure referring monitoring message and errorlog. Replace the failure component.

XSB#XX encountered a hardware error. See error log for details.

[Explanation] An error occurred during hardware diagnosis. There is something wrong with the hardware.

[Remedy] Find out the cause of the DR failure referring monitoring message and errorlog. Replace the failure component.

IP address of DSCP path is not specified.

[Explanation] The DR processing cannot communicate the domain because DSCP IP Address is not set up.

[Remedy] Register the DSCP IP Address.

An internal error has occurred. This may have been caused by a DR library error.

[Explanation] The DR processing cannot be failed on the domain OS. The error occurred at the DR library.

[Remedy] Find out the cause of the DR failure referring monitoring message and errorlog. Confirm the patch applying status and the XCP version.

DR failed. Domain (DomainID X) cannot communicate via DSCP path.

[Explanation] DR processing cannot communicate with the domain. The reasons are that domain is powered off, the DSCP setting is wrong or the error occurs at the DSCP path.

[Remedy] Confirm the domain powered off, DSCP setting, DSCP error with monitoring message and errorlog.

XSB#03-0 could not be unconfigured from DomainID 1 due to operating system error, or XSB#03-0 could not be configured into DomainID 0 due to operating system error.

[Explanation] An error occurred in DR library of domain OS at DR process. The error occurred at configuration management of domain OS.

[Remedy] Find out the cause of the DR failure referring monitoring message and console message. Try again after taking out cause.

Invalid parameter.

[Explanation] There is an error in the specified argument or operand.

[Remedy] Confirm the specified argument or operand and execute the command once again.

Permission denied.

[Explanation] Do not have privilege.

[Remedy] Confirm the user privilege and the command privilege. In the case of high-end servers, please also confirm whether command is executed by XSCF on standby side.

The current configuration does not support this operation.

[Explanation] Cannot execute the command in the current configuration, or it is not supported.

[Remedy] Confirm the current hardware configuration and support status.

A hardware error occurred. Please check the error log for details.

[Explanation] Hardware error occurred. Please confirm monitoring message and the error log.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Replace the failure component.

An internal error has occurred. Please contact your system administrator.

[Explanation] DR failed. There is a possibility that DR failed because of an internal error in XSCF.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Please also confirm the XCP version.

Timeout detected during self-test of XSB#XX-X.

[Explanation] Because the hardware diagnosis in DR did not complete, a timeout occurred. There is a possibility that a hardware error occurred.

[Remedy] Find out the cause of the DR failure referring to the monitoring message and error log. Replace the failed component.

XSB#XX-X will be assigned to DomainID X. Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not.
Input "y" to execute it and "n" to stop it.

XSB#XX-X will be configured into DomainID X. Continue? [y|n]:

[Explanation] Confirming whether DR operation is going to be executed or not.
Input "y" to execute it and "n" to stop it.

XSB#XX-X could not be configured into DomainID X due to operating system error.

[Explanation] An error occurred in DR library of domain OS at configuration process. The error occurred at configuration management of domain OS.

[Remedy] Find out the cause of the DR failure referring monitoring message and console message. Try again after resolving cause.

A.2.4 setdcl

XSB is already assigned to an LSB in a running Domain (DomainID X).

[Explanation] The system board of the specified LSB has already been registered in DCL.

[Remedy] Power off the domain, or move XSB to the system board pool. Try again.

LSB#00 is already registered in DCL.

[Explanation] The system board of the specified LSB has already been registered in DCL.

[Remedy] Confirm the domain, LSB and XSB. Setup data correctly.

LSB#00 has not been registered in DCL yet.

[Explanation] The domain and LSB weren't set up, when the DCL of no-mem, no-io and floating-board was changed.

[Remedy] Set up the domain and LSB. Try again.

DomainID X does not exist.

[Explanation] No LSB was set up on the domain, when the DCL of configuration-policy was changed.

[Remedy] Set up the domain and LSB. Try again.

Invalid parameter.

[Explanation] There is an error in the specified argument or operand.

[Remedy] Confirm the specified argument or operand and execute the command once again.

Permission denied.

[Explanation] Do not have privilege.

[Remedy] Confirm the user privilege and the command privilege. In the case of high-end servers, please also confirm whether command is executed by XSCF on standby side.

An internal error has occurred. Please contact your system administrator.

[Explanation] DR failed. There is a possibility that DR failed because of an internal error in XSCF.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Please also confirm the XCP version.

A.2.5 setupfru

SB#XX is currently in use.

[Explanation] Because the system board of the PSB is running on the domain or is assigned, PSB configuration cannot be changed.

[Remedy] Please confirm whether the system board of the PSB is assigned to the domain or not, and release the system board if it is in the assigned status.

SB#XX is not installed.

[Explanation] Because PSB is not installed, it could not be set.

[Remedy] Please execute it again after confirming installation of the hardware.

Operation has completed. However, a configuration error was detected.

[Explanation] Although configuration of PSB is changed, configuration error is occurring on the system board created. Confirm the CPU module and DIMM slot on the specified PSB and status of Memory Mirror Mode.

[Remedy] Confirm the CPU module and DIMM slot on the PSB board and status of Memory Mirror Mode.

The specified parameter is not supported in this model.

[Explanation] Unsupported parameter in this server is specified. For this reason, the command was canceled.

[Remedy] Confirm the specified parameter and the server model, and execute the command once again.

Invalid parameter.

[Explanation] There is an error in the specified argument or operand.

[Remedy] Confirm the specified argument or operand and execute the command once again.

Permission denied.

[Explanation] Do not have privilege.

[Remedy] Confirm the user privilege and the command privilege. In the case of high-end servers, please also confirm whether command is executed by XSCF on standby side.

The current configuration does not support this operation.

[Explanation] Cannot execute the command in the current configuration, or it is not supported.

[Remedy] Confirm the current hardware configuration and support status.

An internal error has occurred. Please contact your system administrator.

[Explanation] DR failed. There is a possibility that DR failed because of an internal error in XSCF.

[Remedy] Find out the cause of the DR failure referring monitoring message and error log. Please also confirm the XCP version.

A.2.6 showdevices

XSB#%s is not currently running.

[Explanation] The system was not able to get some parameter for the XSB.

[Remedy] Confirm the information for the XSB via the showboards command.

cannot get device information from DomainID.

[Explanation] The system was unable to collect the requested information from the domain.

[Remedy] Confirm that the DSCP setting is correct, confirm that the dsc process is running fine on the domain.

Example: Confirm Swap Space Size

This example shows one way to analyze the physical memory on a system board to determine whether the system has enough swap space to support deletion of a board. It explains how to collect and analyze information using the `showdevice(8)` command on the XSCF and the `swap(1M)` command on the Solaris OS.

In this example, the system board to be deleted contains physical memory and a disk has been attached to it to provide swap space. A disk that is attached to another system board provides additional swap space.

This example is based on the following swap space size and physical memory size. Most of the swap space in the system is still available and the system board can be safely deleted.

- Swap area of the entire domain: 4GB
 - Swap area of the system board to be deleted: 1GB
 - Physical memory of the system board to be deleted: 2GB
1. **Execute the `showdevices(8)` command on the XSCF to show the resources of the system board (XSB#00-0) to be deleted.**

This command displays the total physical memory on the board and the I/O devices that are attached.

```

XSCF> showdevices 00-0
CPU:
----
DID   XSB    id    state    speed    ecache
00    00-0    40    on-line   2048     4
00    00-0    41    on-line   2048     4
00    00-0    40    on-line   2048     4
00    00-0    41    on-line   2048     4

Memory:
-----
DID   XSB    board  perm    base          domain  target  deleted  remaining
00    00-0    2048   0        0x0000000000000000  4096

IO Devices:
-----
DID   XSB    device  resource          usage
00    00-0    sd0      /dev/dsk/c0t0d0s1  swap area

```

Notice in the Memory section that 2048 MB (2GB) of physical memory is on this board. And in the I/O Devices section the /dev/dsk/c0t3d0s1 disk contains a configured swap space.

2. On the domain execute the `swap(1M)` command with its `-l` option specified to determine the size of the swap space configured on the disk.

```

# swap -l
swapfile          dev      swaplo      blocks      free
/dev/dsk/c0t3d0s1 118,1    16          2097152     2097152
/dev/dsk/c1t1d0s1 118,2    16          6291456     4109712

```

Notice that /dev/dsk/c0t3d0s1, the disk to be deleted, contributes 2097152 blocks. Each block is 512 bytes, so this disk contributes 1GB of swap space. Moreover, the domain has additional swap space available from /dev/dsk/c1t1d0s1, a disk connected to another system board, which contributes 6291456 blocks (3GB). Thus, the total available swap space is 4GB.

3. Execute the `swap(1M)` command with its `-s` option to determine the total value of available swap space.

This amount could have been determined in the previous step, but you can use the following command to get a brief summary of the details.

```

# swap -s
total: 40096k bytes allocated + 2200k reserved = 42296k used, 4152008k available

```

Notice that most of the 4GB of total swap space is available. When the system board is deleted, 1GB of total swap space will be removed, and the remaining available swap space will be nearly 3GB. Therefore, there is enough remaining swap space to allow this system board to be deleted.

Glossary

This glossary describes some of the terms used in this manual.

Capacity on Demand (COD)	An option that provides additional CPU processing resources when needed. These additional CPUs are provided on COD CPU boards that are installed in the system. To access the COD CPUs, you must purchase the COD right-to use (RTU) licenses for them.
CPU/Memory Board unit (CMU)	The CPU/Memory unit (CMU) consists of the CPU, memory and CMU channel.
CPU core	A segmented processing unit of the CPU chip. A virtual processor.
CPU module	A module containing one or two CPU chip(s).
Domain Component List (DCL)	List of boards available to be attached to a domain.
domain ID (DID)	Domain identifier.
Domain-SP Communication Protocol (DSCP)	Protocol which provides a user-level to user-level TCP/IP sockets type communication between the Service Processor and a domain. This communication occurs over a mailbox type of communication provided by other software components.
eXtended system board (XSB)	The XSB is made of physical components. In the XSB, the PSB can be either one complete unit (undivided status) or divided into four subunits. The XSB is a unit used for domain construction and identification, and can be also used as a logical unit.
eXtended System Control Facility (XSCF)	The software that runs on this system Service Processor and provides control and monitoring functions for this system platform.

eXtended System Control facility unit (XSCFU)	The XSCF board for this server which contains system administration function and operates with independent processor.
field-replaceable unit (FRU)	A part that can be replaced by field engineers when servicing the system.
firmware	Firmware is the software to control the system. These servers have the following firmware; OpenBoot PROM, POST, XSCF. For details, see the definition of OpenBoot PROM, POST, XSCF in this glossary. SAS controller, GbE controller and control program for IOBOX may be considered as firmware.
Hardware Control Program (HCP)	A date file which contains cluster of XSCF, POST, and OpenBoot PROM firmware settings.
I/O unit (IOU)	The unit of physical print board and mechanical components, consists of I/O controller. The combination/segmentation of CMU and IOU configures the system (domain).
logical system board (LSB)	A logical unit name of an XSB to which a logical number (LSB number) is assigned. LSB is used together with LSB number when domains are constructed and it is referred to by Solaris OS.
motherboard unit (MBU)	The main board assembly to which other boards and components are connected in the servers with a single XSCF Unit. The servers with redundant XSCF Units do not have motherboard unit, but CMUs.
OpenBoot PROM	A layer of software that does the following: takes control of the configured this system from the Power-on self-test (POST) and builds data structures in memory, and boots the operating system. The OpenBoot PROM is IEEE 1275-compliant.
physical system board (PSB)	The PSB is made up of physical components, and can include 1 CMU and 1 IOU or just 1 CMU. In midrange servers, the CMU is mounted on MBU. A PSB can also be used as to describe a physical unit for addition/deletion/exchange of hardware. The PSB can be used in one of two methods, one complete unit (undivided status) or divided into four subunits.
power-on self-test (POST)	A program that takes uninitialized this system hardware, probes and tests its components, configures the working components into a coherent initialized system, and transfers control to the OpenBoot PROM.

privileges	Specific permissions granted to users. This system has platform administrator, platform operator, domain administrator, domain operator, domain manager, user administrator, audit administrator, audit operator and field engineer privileges during the XSCF program running.
Quad-XSB	One of the division types for a PSB to be configured. Quad-XSB is a name for when a PSB is logically divided into four parts. The division type can be changed by using the XSCF command <code>setupfru(8)</code> . Quad-XSB may be used to describe a PSB division type or status.
SCF	See “eXtended System Control Facility”.
Secure Shell (SSH)	A software program which allows the user to log into another system over a network, execute commands on a remote machine, and to move files from one machine to another. It provides strong authentication and secure communications over insecure channels.
Service Processor	A small system that directs system start up, reconfiguration, and fault diagnosis. The Service Processor indicates XSCF in this system. When the service processor is described as hardware, it indicates XSCFU.
system board	Component unit that enables the CMU and the IOU hardware resources to constitute a domain. CPU modules and memories are mounted on the CMU. CPU modules and memory modules are mounted on the mother board (MBU) in the mid-range system. Onboard I/O devices such as a PCI card, hard disk, and LAN port are mounted in the IOU.
Uni-XSB	One of the division types for a PSB to be configured. Uni-XSB is a name for when a PSB is logically only one unit (undivided status). It is a default value setting for the division type for a PSB. The division type can be changed by using the XSCF command <code>setupfru(8)</code> . Uni-XSB may be used to describe a PSB division type or status.
XSCF	See eXtended system board.
XSCF Shell	The CLI interface of the XSCF.
XSCF Web	The BUI (Browser User Interface) interface of the XSCF.

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